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TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5358

No. III. OF VOL. I., 1919.
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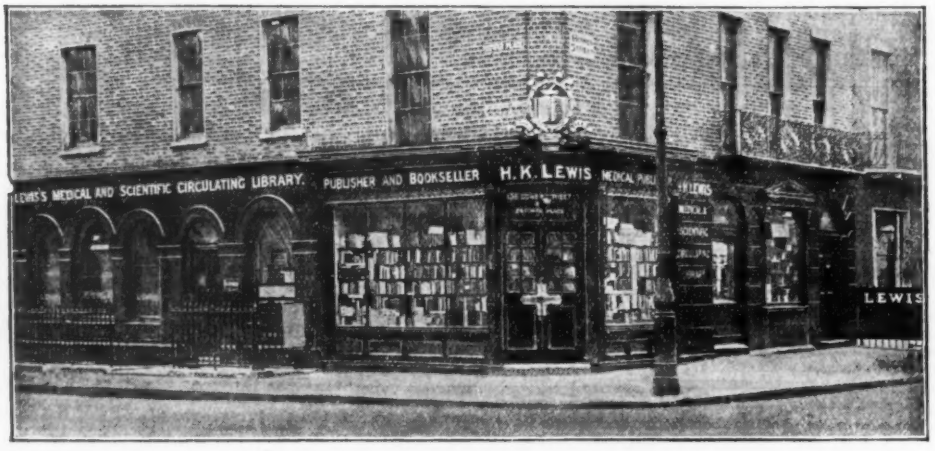

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I.—INTRODUCTION AND HISTORY.

IN examinations of the human alimentary tract by means of a meal opaque to the X rays, the appearance of the vermiform appendix on the fluorescent screen or photographic plate has been until lately infrequent and uncertain. Although there is already a large literature of the radiology of the alimentary tract, references to the appendix are, as would be expected, scanty.

Béclère, in 1909, showed a radiogram of the appendix, which had been taken at the end of 1906, with a five minutes' exposure. In 1910 Liertz, and in 1911 H. D. Reid, reported a similar observation. In 1911 Grigorieff communicated to a congress of physicians in Moscow that he had seen the appendix fill with opaque material, move, and empty itself; and stated that with suitable methods it would fill in all cases in which its lumen was in free communication with the cæcum. M. Cohn, who reported observations of his own in 1913, and from whose paper we quote the Moscow communition, thought that Grigorieff's powers of vision were uncanny; but the description given was accurate enough, and can now be confirmed daily. In the same year (1911) A. C. Jordan had observed that a little bismuth entered the appendix in a good many cases.

In 1913 the work of J. T. Case called the attention of A. W. George and I. Gerber to the appendix. These workers, using an opaque meal of barium sulphate suspended in buttermilk, claimed that the appendix could be seen in 70 per cent. of the patients examined, and published photographs. In 1914 A. F. Hurst expressed the opinion that the appendix was visible on the screen, more or less, in half the cases examined, recording two cases of diseased appendices which had been recognised with the X rays, and Rieder advocated a more thorough examination of the appendix. Case (1914) saw the appendix in one-third of a series of 763 cases and published good photographs, but at that time it was thought probable that the appendix was or had been diseased if the contents of the cæcum were seen within it. In 1915, Imboden published 17 photographs of which 7 were probably normal, and expressed the opinion that the demonstration of the appendix was no evidence of disease; and in the same year George, writing this time with Leonard, published good photographs of diseased appendices. Quimby (1913) and Eisen (1915) have also published instructive papers with photographs. Carman and Miller, of the Mayo Clinic, show a few photographs of appendices in their recent excellent work. They speak doubtfully, however, of the value of direct X ray examination of the appendix.

George and Leonard claimed that with a meal of 90 g. of bismuth, or equivalent of barium sulphate, and one pint of buttermilk the appendix, whether healthy or diseased, unless its lumen be obliterated, can be demonstrated in every instance. Such a claim cannot, of course, be made good, as, short of operation, there is no control means of knowing whether the lumen is obliterated or not. Our observations in the last two and a half years nevertheless enable us to support the view that the opaque meal they use, of barium sulphate and buttermilk, is of great value in the X ray examination of the appendix. With a meal of bread and milk, or porridge, and bismuth oxychloride or barium sulphate, the appendix was often looked for but seldom seen. With buttermilk and barium we now see it in the majority of cases.

II.—METHOD.

We use a rather smaller meal than George and Leonard.

In all cases we have given the same quantity of buttermilk, 3/4 of a pint (425 c.cm.). The amount of barium is varied according to the build of the subject. With a thick body 150 g. is stirred in; with thinner folk less is used. The meal is not so viscid as a standard meal of bread and milk, and holds the barium in suspension better than milk alone. George and Leonard state that cereal mixtures do not readily enter the appendix. Perhaps the absence of milk fat in their meal is also an advantage, or the acidity. The taste of the buttermilk is unpleasant to some, but now that it is clear that the appendix can be demonstrated more palatable mixtures will be sought, and probably found. As regards the examination of the rest of the alimentary canal, we have not found any disadvantage in the use of the buttermilk mixture, but the reverse. For œsophageal lesions a more solid meal would naturally be given. The normal rate of passage of the buttermilk meal through the body is about 12 to 24 hours less than that of a meal of porridge and barium.

An opaque enema has not proved, either in the experience of others or ourselves, to fill the appendix so often as an opaque meal.

We found over three years ago that the appendix is more frequently seen when the bowel has been emptied by castor oil given 36 hours before the opaque meal.

The manner of examination is, of course, of great importance, as well as the kind of meal and the previous emptying of the bowel, for a careful search and suitable manipulation will often reveal the appendix when it would otherwise have been missed. We would lay stress on the following points:—

1. Careful screening with manipulation is needed to find the appendix, also to observe its mobility and the presence or absence of active movements or of tenderness, that is, pain on direct pressure.

2. Photographs must be taken in all cases: we take frequently half a dozen or more of the same appendix. The chief features which help a decision as to whether the appendix is healthy or diseased can only be observed adequately on the photographic plates. These features are—the filling and emptying of the appendix, its position and its outline.

3. The best views are obtained as a rule when the patient is lying down, usually supine; occasionally the semi-lateral position is required, rarely the prone.

4. The gloved hand is used at first in ascertaining the lie of the parts; for the final movements, the wooden spoon is used because it is not opaque to the rays and a plate can be exposed so soon as the appendix is brought into the field.

5. The ileum and cæcum are drawn aside carefully in different positions so as to get a view of the whole appendix whenever possible. A better contrast is obtained if the appendix can be moved over a part of the bowel which contains air before the photograph is taken.

6. When the cæcum lies in the pelvis the appendix can often be shown, but, generally speaking, its mobility cannot be tested. It is possible, however, in most cases to move the cæcum into the iliac fossa by the following procedure. The patient lies on the right side and takes half a dozen deep breaths, then turns semi-prone on the right, still breathing fully; he then moves on to his back and the abdomen is stroked deeply from the symphysis pubis to the right iliac crest. Another means of moving the cæcum out of the pelvis is to distend the rectum with air, the patient lying on the right side; we have used this method, but have generally found it unnecessary.

7. If the appendix lie behind the cæcum it can often be shown by taking an oblique view or by moving the cæcum to one side.

8. It is an advantage if the end of the ileum and the appendix can be shown filled at the same time. Should there be opaque material in the ileum, but not in the terminal part, it will often be moved on into the terminal part if a drink of hot water be given, provided there is no obstruction to prevent the hot water leaving the pylorus. The patient should turn on to the right side.

9. When there is pain, tenderness, or inflammation movements and manipulations must not be made, or only made with great care.

10. A 2 mm. aluminium screen is interposed for both screening and plate exposures, using a Coolidge tube.

11. In doubtful cases where the appendix fills in part only, or empties before it has completely filled, a succession of buttermilk meals at breakfast, lunch, and tea-time may fill it. The usual amount of barium is divided between the three meals.

The value of (i.) the special meal and (ii.) practice is illustrated by the following experience. The first 100 cases in which we observed the passage of an opaque meal through the alimentary canal are left out of account, as the ileo-cæcal region was not examined with such care as is now given it. In the next 200 cases we saw the appendix clearly in a few. Many of these were prepared with castor oil. We then began to use the barium and buttermilk meal after preparation by castor oil. In the next 100 cases the appendix was seen 24 times, in the following 100 cases 35 times, then 54 times, then 72 times, and in the last, and eighth, 100 cases 86 times.

Observations.—We have now photographs of about 300 appendices, seen in the whole or a part of their length. In

many no evidence of disease was found in the appendix or in its neighbourhood; it was in such that the observations described in Section III. below were made. Others were diseased or in close relationship to diseased organs; these are described in Section IV.

III.—THE NORMAL APPENDIX.

Previous observers, especially George and Gerber, George and Leonard, and Case, have noted that in health the shadow may vary in width from ¼ inch down to a thread (Figs. 1, 6, 9, 11, and 12) or a row of dots (Fig. 3); that the lumen may be seen to fill and empty several times, especially in young people; and that it empties finally at the same time as the cæcum. George and Leonard state that it is best seen in the plates taken at 6 hours and at 24 hours after the ingestion of the meal.

As the appendix is often diseased, care is needed before it can be concluded that the appearances seen are not pathological. Clear evidence must be obtained of natural position, mobility, and outline of the appendix and surrounding parts; of a natural rate of filling and emptying of the ileum and cæcum; of the absence of tenderness to direct pressure; and of pain or any symptom suggestive of appendical disease. The mobility of the appendix, so far as it is not limited by its short mesentery, and the absence of tenderness on pressure, cannot usually be determined when the cæcum lies in the pelvis, unless it is, as above mentioned, manœuvred into the iliac fossa. The distal part of the appendix should be movable within the limits of its attachments, and the whole should move freely with the cæcum. The outline of the healthy appendix should show no constant irregularities.

According to our observations the appendix begins to fill soon after material has entered the cæcum—that is, about 3 to 4 hours after the meal has been taken. It may fill in a few minutes from end to end. Frequently, however, the filling is quite slow and is not observed in process; also it may not take place for some hours after the cæcum and ascending colon are filled. In some cases, with rapid filling, the material entering appears of the same breadth throughout (Figs. 10, 11, and 12), as if it were forced in by higher pressure in the cæcum, and occasionally material may be seen to pass along the lumen when the cæcum is pressed gently. In others temporary constrictions can be seen. (Figs. 2, 5, and 8.) We have not actually seen a wave of constriction passing isolated pieces of opaque material from the base towards the apex of the normal appendix, but we have seen material lying loosely in the middle occupy the tip three seconds later, its tail showing a tapered appearance, apparently as a result of a contraction of the appendix, the basal part near the cæcum remaining tightly constricted. In some pathological cases, with over-activity, a definite wave can be seen to propel material from base to apex of the appendix. In such we have observed a block of material moving towards the apex, showing a round head towards the tip and tailed off towards the base where the wave of constriction was grasping it.

Sometimes the appendix can be seen to fill and empty repeatedly during a single screening within a few seconds. This has been most definite in young people; for example, in two subjects aged 16 and 9 respectively (Fig. 5 was taken from one of them). Or it may fill and empty at a slower rate several times in the course of a few hours.

The width of the lumen varies considerably in different appendices and in the same individual; it is usually fully relaxed after fresh material has entered, and becomes constricted later. (See Figs. 31 and 32 taken at an interval of 20 seconds). It bears no proportion to the size of the cæcum and ascending colon. It is usually narrowest at the base—i.e., near the cæcum. (Figs. 6 and 8.)

The time at which the best view is obtained is usually about 12 to 14 hours after the opaque meal, but there is much variation in this respect.

The appendix commonly remains filled until the cæcum is clear, when its contents are discharged. The density of the appendical shadow lessens as the cæcum empties (Fig. 10). In some cases in which there is no evidence of disease the contents remain longer—e.g., until the ascending colon is clear. If there is further delay we regard the appendix as sluggish. The appendix empties itself by waves of contraction which we have seen pass from the tip to the base, propelling material into the cæcum. It may empty while the cæcum is still filled.

In some cases the tip can be seen to wave about actively with a serpent-like motion (Figs. 7 and 8), presumably from contractions of its wall, or from the passing in of material from the cæcum. Such movement of the middle part has also been observed repeatedly at the same time as food was passing from the ileum into the cæcum.

It has been stated that the appendix tends to become gradually obliterated with age. This is not, however, a necessary accompaniment of advancing years, for in one of our subjects, aged 74 years, in whom the alimentary canal appeared to be healthy in all respects, the diameter of the shadow was greater than that in many young people. (Fig. 10.)

In one patient, in whom the appendix was found healthy, on re-examination 18 months afterwards two pellets of shot were seen within it and could be moved about (Figs. 11 and 12.) They gave rise to no symptoms, but the appendix emptied itself more slowly than before, containing some barium 24 hours longer than the cæcum. The abdomen was screened weekly and three weeks later the pellets had gone. A similar occurrence was recorded by G. H. Orton in 1907, but the appearances were not so distinct, the nature of the foreign bodies casting the shadow being discovered at an operation. The appendix appeared healthy.

IV.—THE DISEASED APPENDIX.

In most cases of acute appendicitis the patient is not fit to be X rayed; neither is such a method of diagnosis needed.

In the diagnosis of chronic appendicitis we have found direct X ray examination of the appendix of great value, not only in cases in which suspicion had been cast upon that organ, but especially in the subjects of vague abdominal symptoms of unknown cause; in many such it has been possible either to demonstrate a normal appendix or to show that it was or had been the seat of disease.

The direct observation of the appendix is only a small part of the complete examination of the alimentary tract, and in many cases in which a suspected appendix has been found normal an explanation of the symptoms is furnished by lesions or disorders discovered elsewhere in the course of the examination. Every part of the stomach and bowel must, of course, be observed carefully. Further, it must be emphasised that all such methods of investigation are supplementary to a thorough clinical inquiry. Indispensable as the laboratory is for the medicine of to-day, it can never replace accurate and exhaustive examination at the bedside.

We have not been situated especially favourably for the observation of cases of chronic appendicitis, as Duff House is for medical cases, and no patient is sent there who is known to be the subject of that complaint. Our cases are therefore of two classes: (1) those in whom the symptoms of chronic appendicitis have not been definite; and (2) patients sent by doctors in the neighbourhood. The latter class is small in numbers, but has the advantage that one of us has frequently been able to be present at the subsequent operation.

In 36 cases we have details of operative findings, and upon these this section is mainly founded. A summary of each is given. Our opinions and conclusions are founded also upon the examination of other cases. We have in all, as stated in Section II., photographs of 300 appendices with a clinical history of each patient.

It is sometimes possible to make a diagnosis of chronic appendicitis from X ray findings in the ileo-cæcal region other than direct observations of the appendix. Such findings as adhesions of parts, ileal stasis, insufficiency of the ileo-cæcal valve, and spasticity of the colon have been put forward as affording contributory evidence of appendicitis. Adhesions about the appendical region are, of course, suggestive of former inflammation. Ileal stasis is an uncertain guide.* It was present in 21 out of 35 cases operated upon; also in cases in which the appendix had been removed. Eisen states that ileal stasis and regurgitation are as frequent in normal cases as in those of appendicitis. To insufficiency of the ileo-cæcal valve and spasticity of the colon we do not attach importance in this connexion. Examination of the appendix itself with the buttermilk meal gives more valuable information in most cases than can be derived from observations on surrounding parts made with those opaque meals which enter the appendix less often.

In the direct examination of the appendix the points to which attention must be paid are: (1) the filling or emptying of the appendix—delay or stasis; (2) shape—constric-

* Ileal stasis has been said to be present if the terminal ileum is not empty nine hours after the opaque meal. Such a definition can only apply if the stomach is empty in a normal time, for the ileum cannot discharge its contents promptly unless it receives them promptly from the stomach. This fact has sometimes been overlooked and ileal stasis has even been depicted in the literature by a photograph in which opaque material can still be seen in the stomach. As a working definition we speak of ileal stasis or delay if the terminal ileum contains opaque material more than four hours after the stomach is empty.

tion and dilatation; (3) fæcal concretions—vacuoles; (4) mobility; (5) hyperactivity—spasm; (6) tenderness; (7) position. These features are placed in the order of their value in a series of cases. In individuals any one feature may be of chief importance.

1. *The Filling and Emptying: Delay or Stasis.*

The appendix may not admit any barium, or not enough to cast a shadow, either because it already contains inopaque material or because it is obstructed or obliterated. The first is but seldom the case when the bowel has been purged with castor oil. Constriction near the base or obliteration will, of course, account for some of the cases in which the appendix is not seen. (Cases 29 and 30.) The fact that with increasing practice more and more appendices are visible shows that an impervious lumen is much less common than was thought. But we do not think it justifiable in the present state of our knowledge to conclude that an appendix is abnormal because it does not fill; though we should naturally regard it with suspicion, as it is unusual to fail to demonstrate the appendix in a person thought to be normal, especially if a second examination be made with three small buttermilk and barium meals, as described above.

Most frequently in chronic appendicitis the appendix fills in part (Figs. 13, 16, and 18), the passage of barium into the distal part being blocked, sometimes by obliteration (Fig. 20 and coloured drawing, Case 8), or constriction or kinking (Fig. 17), but generally by stagnant inopaque material (Figs. 13, 16, and 18) which the appendix has been unable to expel owing to limitation of movement by inflammation or its results. Sometimes the barium mixes with this material, forming a fainter shadow.

Such interference with the muscular activity of the appendix wall also prevents the punctual discharge of the barium which has entered, so that instead of the appendix emptying at about the same time as the cæcum it retains its contents 12, 24, or more hours longer. We have seen barium remaining for 26 days, and it has been known to remain for several weeks. Sometimes a blob of material also remains in the adjoining part of the cæcum, which forms a sort of antechamber to the appendix.

In cases of moderate appendical stasis without any other abnormal feature such as irregularity of outline, uneven filling, immobility or tenderness, we have not recommended excision; though an appendix showing prolonged stasis is one in which fæcal concretions would be likely to form. If the shadow is very fine and the appendix rigid there is probably a fibrous atrophy.

2. *Shape: Constrictions and Dilatations.*

Irregularity in the outline of the shadow, is, next to uneven filling, the commonest sign of diseased appendix. Care must be taken, by repeating the photographs, to see that the irregularities are persistent and are not due to normal waves of contraction. Many forms of dilatation and constriction are illustrated in Figs. 13, 17, 19, 21, and 22, and in the coloured illustrations.

3. *Fæcal Concretions; Vacuoles.*

Concretions of long-standing become infiltrated with lime salts and cast a shadow which may be seen independently of an opaque meal (Fig. 14). Such a shadow may be confounded with calculi in the urinary tract. It is usually a symmetrical oval which may help to distinguish it from the shadows of calcareous glands and phleboliths. The lumen proximal to an old concretion is often bent into a sharp hook; indeed, a hook-shaped end to the appendical shadow, as in Figs. 14, 18, and 22, should suggest the possibility of a concretion.

More recent concretions, which cast no shadows of their own, may block entirely the passage of barium, in which case they cannot be recognised, though they may be suspected in appendices of irregular outline which fill in part only and show a hook. In Figs. 16 and 18, for example, such concretions lay in the distal part of the appendix which did not show in the photographs. In many cases the barium passes round a soft concretion, which then gives the appearance of a vacuole (Figs. 13, 17, and 18). There may be more than one of these abrupt or gradual widenings of the lumen, which are constant in different photographs, alternating with narrow places. In other cases the barium extends around the proximal part only of the concretion, giving a V- or cup-shaped shadow as in Fig. 13.

4. *Mobility.*

If the appendix cannot be moved about within the limits of its attachments adhesions are suspected, but if the cæcum and appendix lie in the pelvis this sign cannot, as a rule, be established unless they can be brought into the iliac fossa. Adhesion of the appendix to other parts of the digestive tube can often be shown by manipulation, the adherent parts moving together. Thus the appendix shown in Fig. 23 (Case 12) could not be moved away from the cæcum. It is most often adherent to the iliac fossa, the ileum, the cæcum, or in the pelvis. In Case 2 (Fig. 14) the ragged outline of the ascending colon where the appendix appeared fixed confirmed the suspicion. The appendix may fill with barium, even when it is bound down for the whole of its length, as in Case 17 (Fig. 26), where inflammatory membranes covered the appendix and cæcum and constricted the ileum.

Sharp kinks must be noted carefully, but it is important to take several photographs, for what appears to be a kink in one may prove to be a rounded curve when viewed from another aspect. (See Case 15, Figs. 27 and 28.)

5. *Hyperactivity: Spasm.*

The normal filling and emptying movements of the appendix, which in the young are, like the mass movements of the colon, often vigorous and rapid, may be aggravated in older people by acute and subacute inflammation in those parts of the appendix in which gross changes have not taken place. In chronically inflamed appendices containing a fixed fæcal mass offering resistance to free progress we have observed vigorous waves travelling from the cæcum towards the tip (Fig. 30), but not in the reverse direction, even when barium lay distal to the obstruction. Such hyperactivity was observed in Cases 1 and 14. Figs. 16 and 30 are photographs of appendices during contractions. The drawing here shown was made from an inflamed appendix which showed vigorous contractions apexwards proximal to an obstruction.

C, Cæcum. o, Obstruction. p, Trail of preceding wave of constriction. wave, Abrupt and complete obliteration of the lumen by wave of constriction starting at the vestibule propelling block of material before it.

Such pathological hyperactivity differs from the normal activity in that it is often continuous for hours during the filling period; we have even seen it still going on at 24 and 36 hours. Whereas the normal movements are only seen, through the good luck, so to speak, of happening to observe the appendix at the right moment. The block of material in the normal appendix also shows as a rule a symmetrical tapering each end, which can be seen in Figs. 2 and 5.

Another characteristic appearance of the inflamed appendix is that of spasm. A particular part remains constricted for a considerable time, the blocks of opsque material being cut off abruptly (Figs. 15, 25, and 33), whereas when they are being moved on by waves of contraction they have tailed or rounded ends (Figs. 16 and 30). Slight or varying dilatation of the lumen is nearly always present also. When concretions are present there is generally no spasm. A very small lesion may cause spasm and impair the rate of emptying. In one case there was spasm at a place where a spray of purple spots in a mucous crevice was afterwards found.†

6. *Tenderness.*

Tenderness or pain on direct pressure over the appendix shadow may be a valuable and unequivocal sign of inflammation. An enlarged part of an appendix is frequently, though by no means always, painful on direct pressure. But, taken alone, tenderness is of less uniform significance than might be expected. It is not safe to make a diagnosis of appendicitis from tenderness in the absence of the more important signs above mentioned. If direct though gentle pressure is made upon the base of the appendix pain is often felt,

† In order to avoid confusion between inflammation and trauma the surgeon should take the mesenteric tissue into the forceps during removal, and not the appendix itself.

DETAILS OF 36 CASES IN WHICH THE RADIOGRAPHIC AND OPERATIVE FINDINGS HAVE BEEN COMPARED; AND INDEX TO FIGURES OF DISEASED APPENDICES.

Case.	Clinical summary.	X ray.	Operation.
1 (564)	Male, aged 20; had suffered for years from intermittent pyrexia, constipation, diarrhœa, and abdominal pain. Pyrexia had been ascribed to phthisis, evidence of which years before; appendix had not been suspected.	*Fig. 13.*—9 hours after opaque meal. Appendix lies horizontally, across irregular shadows from ileum, tip near umbilicus. Proximal part filled and showed vigorous contractions. Shadow beyond formed dilatation with irregular cupped or V appearance, due to barium reaching round sides of a fæcal mass * This part and base were tender. An hour later proximal part was contracted. At 24 hours all material except a coating had passed from bowel, but not from appendix. At 48 hours still barium in appendix and in adjoining part of cæcum. (See also Fig. 13 A.)	Two inflamed enlargements of appendix. (See coloured drawing I.) Barium had reached to first one; acute bend beyond and large bulbous end not shown on plate. First enlargement contained soft solid matter, terminal one hard fæcal mass. No appearances of tuberculosis in appendix or surrounding peritoneum.
2 (696)	Male, 36. Flatulence, heartburn, wasting, weakness. 6 years' history; worse last 2½ years. Had been X rayed repeatedly; treated for dilated stomach; advised to have large intestine removed. Appendix not suspected.	*Fig. 14.*—8 hours after opaque meal. Cæcum lies in pelvis. Shadow of material in cæcum and ascending colon is interrupted at brim of pelvis. Appendix lay upwards, partly behind ascending colon. Proximal part appears natural. Distal part was large till near end, where narrow curved constriction can be seen, ending at oval concretion; this could not be moved from ascending colon, which had here ragged outline, ascribed to adhesions. (See explanatory diagram.)	Position as shown in photograph. Complete narrow mesentery, loop seen being due to shortening at one part. Appendix somewhat dilated beyond bend; after dilatation there was fibrous constriction and large concretion beyond. Wall enclosing concretion adherent to ascending colon. (See coloured drawing II. Drawing is less than natural size.)
3 (615)	Female, 32. Pain in umbilical region on much exertion; easily tired; bowels irregular. X ray evidence of former phthisis. Appendix had not been suspected.	*Fig. 15.*—13 hours after opaque meal. Appendix lay upwards behind cæcum; it appeared large and somewhat irregular, and showed spasm at all stages. Tip did not fill.	Middle of appendix enlarged, blue and inflamed, tip fibrous. (See coloured drawing III.)
4 (658)	Female, 31. Flatulence, headaches, bad taste; several years' history	*Fig. 16.*—10 hours after opaque meal. Shadow shown spreading out into dilatation of appendix. Opaque material not seen beyond inflamed area. At 24 hours cæcum lay in the pelvis. Appendix is still irregularly filled. It lay upwards; tip bent and could not be moved about; except that the proximal part could be moved as a whole with cæcum. In same position at 10, 24, and 36 hours; was tender. No ileal stasis.	Appendix narrowed near base and bent and anchored by short mesentery. Beyond this dilated and congested. (See coloured drawing IV.)
5	Female, 13. Repeated attacks of severe pain in right iliac fossa.	*Fig 17.*—36 hours after opaque meal. Appendix filled imperfectly; kinked, irregular in outline, bulbous tip, tender. Middle part gave faint diffuse shadow such as is seen when opaque material mixes with inopaque. Cæcum filled irregularly; no definite notches at any stage; ileal terminal was not seen evenly filled. No ileal stasis. (See explanatory diagram.)	A pericæcal membrane. Appendix enlarged, kinked, inflamed; concretions at end, one solid. (See coloured drawing V.)
6 (584)	Male, 44. Indigestion on and off over 25 years. 24 years ago short attack abdominal pain and pyrexia; may have been appendical. On active service in France 3 years, including retreat. Worse last few months. Hyperacidity.	*Fig. 18.*—36 hours after opaque meal. Cæcum lay in usual position of hepatic flexure. "Ascending" colon descended from it in front; then turned to left to become transverse colon. Appendix did not fill well; seen above cæcum curled upwards and to right. Bulbous; had hook appearance often seen proximal to concretion. Much delay, material still in appendix at 140 hours. Rest of bowel clear at 72 hours. Kinking of ileum with stasis.	Cæcum and ascending colon had each a mesentery. Cæcum lay high in loin, ascending colon depending from it in front. Appendix long, congested, bulbous, and contained concretions. (See coloured drawing VI.)
7	Male, 45. Symptoms of hyperacid indigestion for years.	*Fig. 19.*—8 hours after opaque meal. Outline of appendix irregular. X ray evidence of duodenal lesion. No ileal stasis. (See also Fig. 19 A.)	Appendix bulbous, adherent, contained concretions. (See coloured drawing VII.) Ulceration or cicatrisation of duodenum.
8	Male, 54. Ten years' history of hyperacid type of indigestion, flatulence, and distension in right iliac fossa three hours after food.	*Fig. 20.*—24 hours after opaque meal. Appendix seen filled imperfectly at all stages; emptying much delayed. Terminal ileum anchored to iliac fossa; great delay in ileum.	Tip of appendix fibrous. (See coloured drawing VIII.) Lane's kink in ileum.
9 (713)	Male, 38. Occasional attacks of indigestion for over 20 years. Hyperacidity.	Proximal part of appendix much dilated. A little diffuse barium seen to enter distal part 4 hours earlier does not now show; it appeared packed with stationary fæcal matter. Material delayed in dilated proximal part of appendix and adjoining part of cæcum after rest of bowel was empty. Also X ray evidence of lesion of duodenal cap.	Appendix bound down; constriction near middle. Also a hard scar in first part of duodenum.
10	Female, 16. Pain after food; much worse at periods.	*Fig. 21.*—10 hours after opaque meal. Irregular bulbous appendix; delayed emptying; no tenderness; ileal stasis.	Appendix big. Signs of recent inflammation—e.g., thickened mucous lining and injected subperitoneal vessels.
11 (626)	Female, 25. Attack of abdominal pain, tiredness, and anorexia six weeks before, succeeded as it passed off by pricking pain in right iliac fossa.	*Fig. 22.*—24 hours after opaque meal. Appendix has irregular outline, proximal part much the larger at all stages. Hooked appearance associated with concretion shown. No tenderness. Ileal stasis.	Whole appendix thickened; three concretions.
12 (788)	Female, 36. Occasional attacks of epigastric discomfort, with vomiting, for years. Three days before admission more severe gnawing ache, pyrexia, rapid pulse, and furred tongue. Tenderness to right of umbilicus.	*Fig. 23.*—6 hours after opaque meal. Appendix filled unevenly; irregular outline, constriction. Proximal part not mobile; tender. Appearance constant. Terminal ileum on right of picture; ileal stasis. *Fig. 24.*—At 36 hours. Stenosis at junction of middle and proximal third. Distal part now filled better; irregular outline; spasm near end. Dropped transverse colon lies to right of picture.	Operation 7 days later. Appendix partially bound to cæcum near base and kinked; bulbous end. It had appearance of subsiding inflammation.
13	Male, 25. Pain and tenderness in right iliac fossa. Had vomited twice.	*Fig. 25.*—14 hours after opaque meal. Appendix showed irregular outline, spasm, and tenderness. No ileal stasis.	Very long appendix. Two patches of inflammation of mucous membrane.
14	Male, 14. Two mild attacks of appendicitis. Headaches.	*Fig. 29.*—10 hours after opaque meal. Appendix showed irregular outline, contracted vigorously; was tender. End of appendical shadow seen spreading. Ileal terminal appeared incapable of normal dilatation at all stages; much stasis.	Appendix had been inflamed, constricted by band; was narrowed near base, dilated at middle part. Ileum bound down.
15	Female, 37. Had had dysentery. Sought advice for loss of flesh and appetite. Mild indigestion.	*Fig. 27.*—8 hours after opaque meal. Appendix showed constriction, constant, near base. Terminal part seen to contain inopaque material. Some ileal stasis. *Fig. 28.*—At 8½ hours. Shadow of appendix shows that what appeared kink in Fig. 27 is rounded curve. Sharp bend in ascending colon, which is fastened to transverse colon; irregular segmentation in both. Calcareous glands seen.	Appendix showed constriction. Large bowel bent and adherent as described. Calcareous glands were removed.

* The appearance was not altered by gentle pressure, as is sometimes possible when blockage is due to soft matter or bubble.

DETAILS OF 36 CASES IN WHICH THE RADIOGRAPHIC AND OPERATIVE FINDINGS HAVE BEEN COMPARED; AND INDEX TO FIGURES OF DISEASED APPENDICES—(*Continued*).

Case.	Clinical summary.	X ray.	Operation.
16 (275)	Male, 45. Patient X-rayed 18 months before. Meal of porridge, milk, and barium. Appendix not seen.	Long curled appendix seen lying external to cæcum. Ileal stasis.	Operation a year later; appendix found as described. Calcareous gland in its mesentery close to appendix wall, causing bend in proximal part; vessels in this region somewhat injected.
17	Male, 30. Acute appendicitis 12 years ago; appendicectomy refused. Milder attacks followed; increasing constipation; frequent distension after food. Condition becoming grave.	*Fig. 36.*—10 hours after opaque meal. Appendix retrocæcal and fixed, but position could be made out and is shown in explanatory diagram. Whole region tender. Terminal ileum constricted; enormous dilatation of ileum behind constriction; marked stasis.	Terminal ileum, cæcum, and appendix were wrapped tightly in inflammatory tissue thought to have arisen from disease of appendix. Ileostomy was done as temporary measure, but issue was fatal.
18 (685)	Male, 59. Patient sought admission for severe pain. Hyperacidity; X ray evidence of lesion about pyloric region.	Appendix showed two constant narrowings and hooked appearance; material remained in it at 72 hours, cæcum having discharged its contents. Ileal stasis.	Pylorus adherent to gall-bladder and liver. Appendix contained two hardened masses of fæces, one fixed and one movable.
19 (619)	Discomfort after food 4 months. Hyperacidity. Symptoms improved with treatment. Six weeks later pain and tenderness in right iliac fossa for 24 hours with pyrexia.	Appendix kinked at middle where outline was irregular; it appeared fixed, though moving freely with cæcum. Tip did not empty its contents for over 12 hours after cæcum. No ileal stasis.	Appendix inflamed.
20	Male, 60. 15 years' history of excessive flatulence after food.	Proximal part of appendix was kinked and irregular in outline. Much ileal stasis.	At operation appendix adherent to ileum and kinked. Jackson's membrane and Lane's kink.
21	Female, 12. Periodic bilious attacks.	Appendix showed persistent bulbous appearance; constriction beyond. No tenderness. No ileal stasis.	Showed dilatation and constriction.
22	Female, 22. Nutrition poor; occasional bilious attacks; vomiting; no pain.	Base only of appendix seen. Ileal stasis.	All appendix except first inch bound down. A Lane's band.
23	Male, 38. Symptoms suggested duodenal ulceration.	Appendix appears fixed along inner border of cæcum. X ray evidence of duodenal ulcer.	Duodenal ulcer. Appendix adherent as described, and extended about halfway up ascending colon. Otherwise it appeared healthy inside and out.
24	Male, 12. Recurrent attacks of vomiting; a little pain.	Cæcum lay under ribs. Appendix appeared kinked. It contained chiefly air, could not be displaced; was tender. No ileal stasis.	Appendix lay as described. It was kinked by band of adhesions and had been inflamed.
25	Male, 65. Long-standing pain in right side of abdomen and constipation.	Appendix retrocæcal and fixed; otherwise appeared normal. Ileal stasis.	Appendix adherent behind cæcum. Jackson's membrane.
26	Female, 27. Indigestion, constipation, and anæmia. Had been treated as case of gastric ulcer.	Appendix lay behind cæcum. Ileal terminal filled irregularly; much delay therein.	Retrocæcal appendix adherent to terminal ileum. Stomach normal.
27	Female, 42. Symptoms of duodenal ulceration.	Appendix filled in part only; not tender. X ray evidence of duodenal lesion. No ileal stasis.	Duodenal ulcer. Appendix had been inflamed and was kinked.
28	Female, 28. Pain in right side of abdomen near ribs, going round to back.	Very little opaque material passed into appendix. Some ileal stasis.	There were adhesions between appendix and terminal ileum.
29	Male, 10. Not thriving; occasional bilious attacks; vomiting. No pain.	Appendix not seen. Ileal stasis.	Appendix kinked and not patent.
30	Male, 50. Symptoms of duodenal ulceration.	No barium seen in appendix. No ileal stasis.	Duodenal ulcer. Appendix was represented by fibrous cord.
31	Female, 18. Intermittent pain in right side radiating to back, never acute; constipation and poor appetite. Tender spot on palpation.	Appendix showed irregular bulbous outline; was tender. Ileal stasis.	Appendix dilated in places; had been inflamed.
32	Male, 42. Pain to right of umbilicus relieved by emptying bowel. Constipation. Had had appendicitis 17 years before. Dilated ascending colon.	Only first part of appendix filled; this was tender on pressure.	Old and recent adhesions about appendix which was patent for about an inch. Distal part obliterated.
33	Female, 16. Recurring abdominal discomfort with indigestion. Six weeks ago pain in right iliac fossa and rise of temperature.	Proximal part of appendix irregular; spasm seen beyond. Distal part kinked. Material remained in appendix for 20 days.	Appendix loosely anchored to brim of pelvis. Distal part kinked; contained concretions.
34	Male, 19. Indigestion several years; periodic attacks of pain in abdomen, especially to right. Bouts of diarrhœa and constipation.	Appendix lay behind cæcum, filled irregularly, and appeared rigid.	Appendix lay behind cæcum and showed irregular narrowings.
35 (823)	Female, 37. Ten years' history of epigastric pain two hours after food, flatulence, and constipation. Recently nausea, salivation, and retching after exertion. Gastric juice hyperacid.	Proximal part of appendix dilated, with narrowing beyond; narrow portion appeared fixed and kinked. Tip reached to middle of spine. Crater of gastric ulcer seen on lesser curvature, and arrest of peristalsis.	Appendix long, kinked, and contained large concretion at distal end. Gastric ulcer on lesser curvature of stomach
36	Female, 26. Periods of diarrhœa since childhood. In last five years flatulence, heartburn, general discomfort, irritability, and depression. Mucus in stools at times.	Appendix much dilated; spasm at one point, with small projection beyond. Distal part did not fill. Material remained at 72 hours when rest of bowel was clear.	Appendix hypertrophied and wall œdematous. Several concretions.

Figures from Cases Not Operated Upon.

Fig. 30, No. 587.—Male, aged 70. 12 hours after opaque meal. The appendix had an irregular outline and showed great over-activity, waves of contraction passing material continually from the base towards the tip. The waves ceased where the appendix became bulbous. Ileal stasis. The patient had periodic indigestion with vomiting, but had recently had the prostate excised. No further procedure was advised at present.

Fig. 31, No. 792.—Male, aged 48. 7 hours after opaque meal. Early stages of filling with wide lumen.

Fig. 32.—The same. 20 seconds later. A narrow curved tip can be seen. There was a little ileal stasis.

Fig. 33, No. 430.—Male, aged 49. 9 hours after opaque meal. The appendix shows a dilated proximal part with hook appearance, and is abruptly bent. Spasm. It is tender. The patient is subject to cramping pains on the right side of the abdomen. There were reasons against operation, but he was advised that he must not go far away from the possibility of surgical help. There was a little ileal stasis.

Fig. 34, No. 699.—Male, aged 50. 48 hours after opaque meal. Retrocæcal appendix with irregular outline. Stasis; the cæcum is partly empty. At 96 hours when the rest of the bowel was clear there was still a residue in the tip of the appendix. No ileal stasis.

Fig. 35.—Female, aged 14. 120 hours after opaque meal. Stasis. 26 days later the opaque material was still to be seen in the appendix.

usually at the spot pressed upon, but sometimes in the left side of the abdomen. The temperament and general condition of the patient must never be forgotten in interpreting this sign.

In a case of serious gastric disorder the appendix lumen was large and filled and emptied naturally, but the patient complained of severe pain when it was pressed upon gently. He was X rayed again after a fortnight, the same sign being obtained several times in each series of observations. In recommending immediate exploration of the stomach the opinion was given that the appendix was inflamed. At the operation the stomach was found to be the seat of a growth, but the appendix was healthy. This is the only case so far in which we have thought the appendix to be diseased and it has not proved to be so at operation.

Explanatory Diagrams to Figs. 3, 5, 6, 11, and 12. (Normal Appendices.)

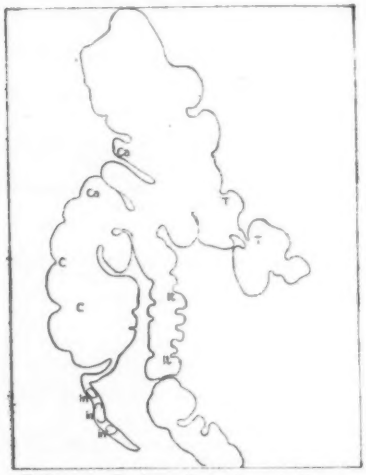
3

A, Appendix. Ao, its orifice. C, Cæcum. It, Ileal terminal. T, Segments of transverse colon.

5

A, Appendix. Ab, Its base. Ao, Its orifice. C, Cæcum. Ca, Traces in ascending colon. S, Sigmoid.

6



C, Cæcum. Ca, Ascending colon. in, Spaces of inopaque material in appendix. It, Ileal terminal. T, Transverse colon.

11

Ab, Appendix base. in, Inopaque material. pp, Pellets in appendix tip. C, Cæcum.

12

C, Cæcum. in, Inopaque material. p, pellet.

INDEX TO FIGURES OF NORMAL APPENDICES.

In all the figures the observer is facing the patient. The observer's left is, therefore, the right-hand side of the body.

Fig. 1. Male, aged 12. 8 hours after opaque meal. The appendix is S-shaped, lying between the cæcum, on the observer's left hand, and the terminal ileum, on the right. The little projection just below where the shadow of the appendix leaves the cæcum is due to a wave of contraction in the part of the cæcum from which the appendix arises. This wave was seen to be travelling appendix-wards. The apparent gap in the shadow of the ileum, opposite the appendix tip, is due to a wave of contraction forcing the contents of the ileum towards the cæcum.

Fig. 2 (No. 570). Male, aged 47. 9 hours after opaque meal. The shadow of the transverse colon lies to the observer's right.

Fig. 3 (No. 559). Male, aged 58. 7 hours after opaque meal. Semi-lateral view from the patient's left. The appendix lies behind the cæcum. See explanatory diagram.

Fig. 4 (No. 514). Female, aged 28. 6½ hours after opaque meal. The cæcum lies in the pelvis. The ileum is seen descending in the middle line to join it. The appendix lies to the left of the middle line.

Fig. 5. Female, aged 16. 24 hours after opaque meal. The cæcum is in the pelvis and the appendix in the iliac fossa. It was seen to fill and empty several times, and was movable. The dark mass to the observer's right is the sigmoid flexure. At a subsequent operation this appendix was seen to be normal. See explanatory diagram.

Fig. 6. Female, aged 37. 10 hours after opaque meal. The appendix shows a dotted appearance, from the alternation of opaque and inopaque material. See explanatory diagram.

Fig. 7. To show movement of the appendix. The same subject as Fig 1. Two successive exposures were given within one second on the same plate. The blurring of the shadow as compared with Fig 1 shows how the tip was waving. This photograph was taken three seconds after Fig. 1. A comparison of the two shows also changes in the outlines of the ileum and cæcum due to contractions.

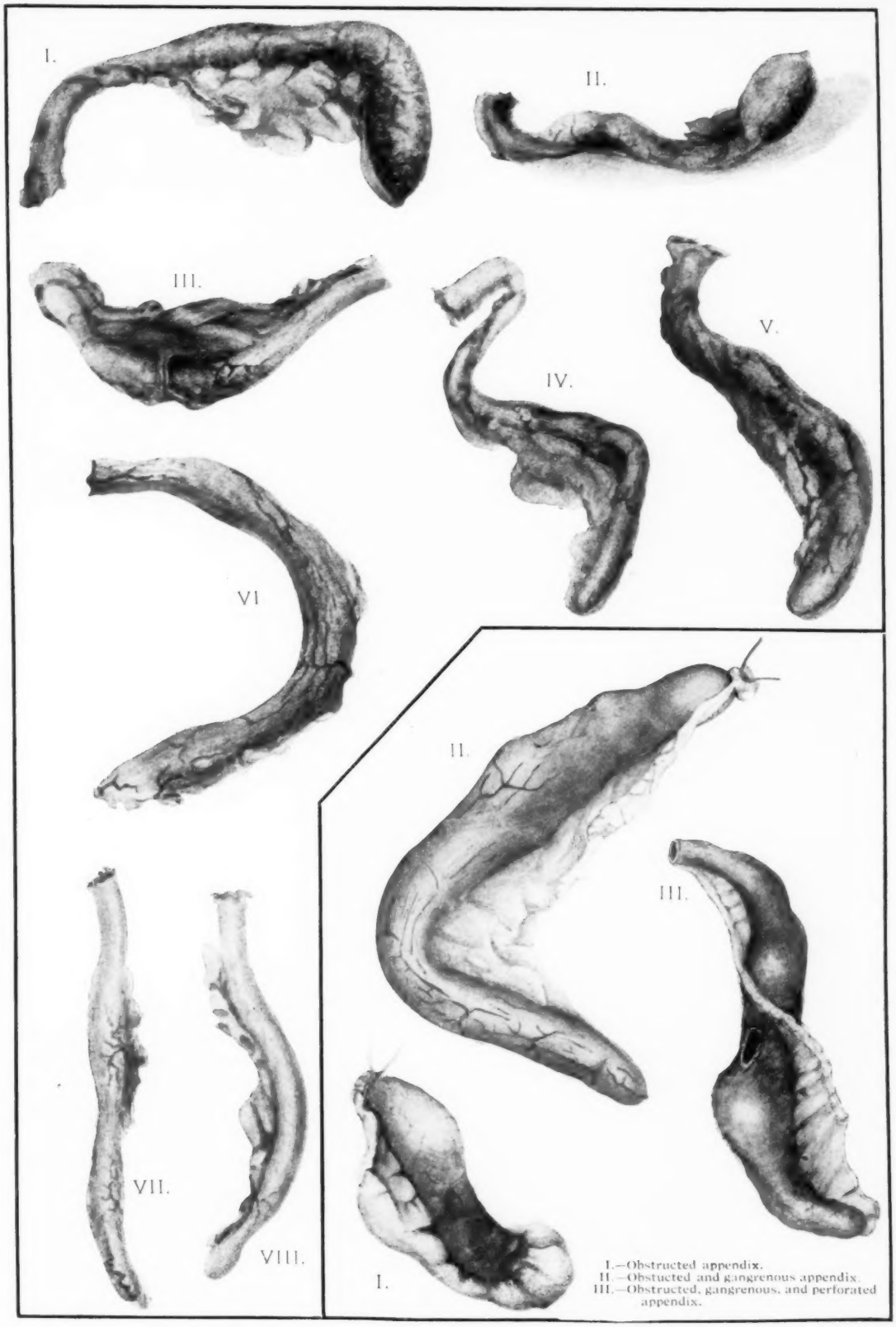
Fig. 8. To show movement of the appendix. Male, aged 11. 24 hours after opaque meal. Two exposures within one second. The blurring of the tip shows movement. A wave of contraction, appendix-ward, is taking place in the part of the cæcum from which the appendix arises. The proximal part of the appendix is contracted.

Fig. 9. The same subject. One exposure three seconds later than Fig. 8. No contraction is visible in the part of the cæcum from which the appendix arises. The proximal part of the appendix is now relaxed and filled with opaque material.

Fig. 10 (No. 569). Male, aged 74. 60 hours after opaque meal. The appendix shows no diminution of lumen on account of age. At 72 hours the appendix and cæcum were empty.

Fig. 11 (No. 493). Male, aged 34. 7 hours after opaque meal. Two shot may be seen in the end of the appendix. See explanatory diagram.

Fig. 12.—The same subject at a later stage. The pellets lie separate in the end of the appendix, which is now curled up. See explanatory diagram.

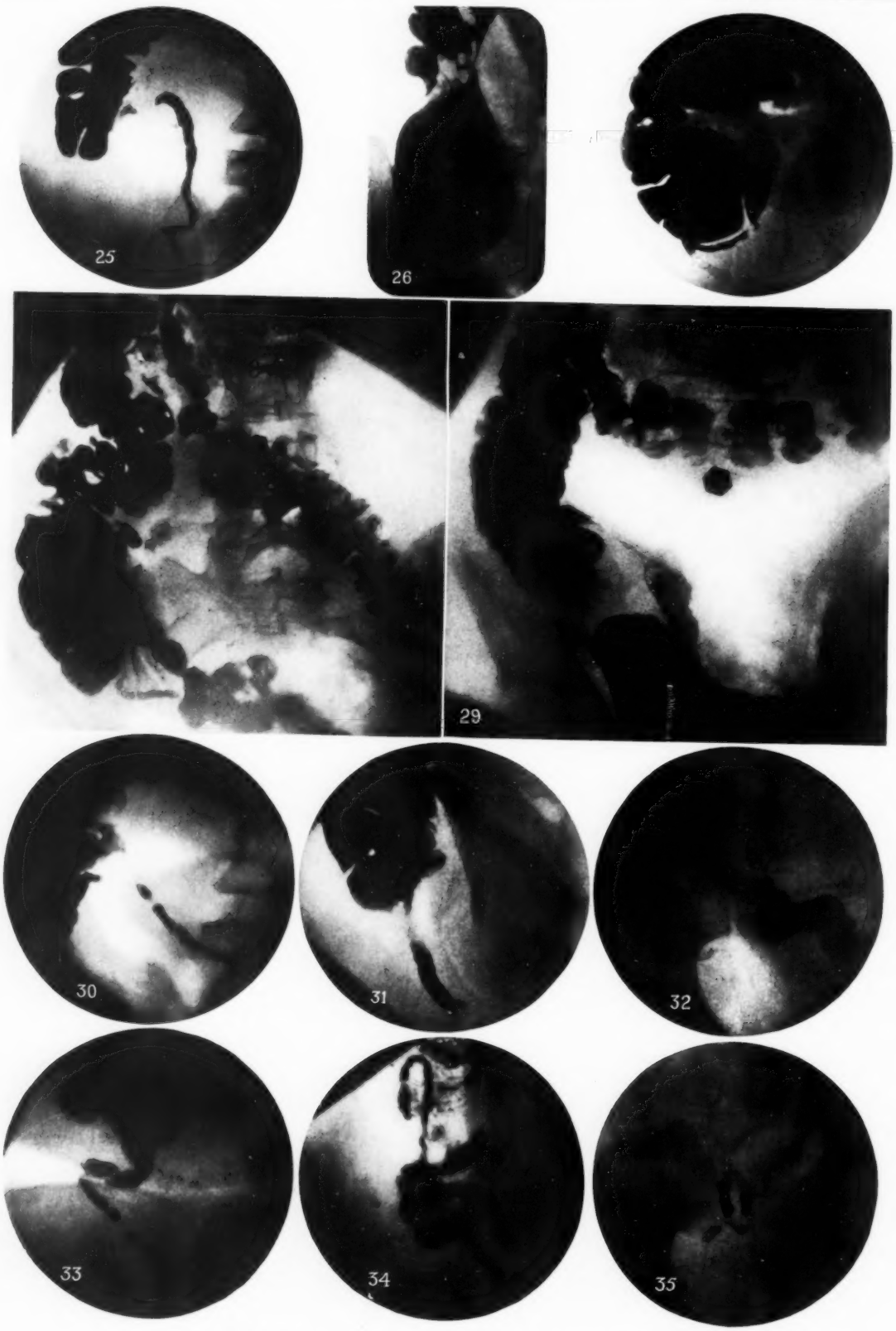


I.—Obstructed appendix.
II.—Obstucted and gangrenous appendix.
III.—Obstructed, gangrenous, and perforated appendix.

MR. S. T. IRWIN: ACUTE APPENDICITIS AND ACUTE APPENDICULAR OBSTRUCTION.

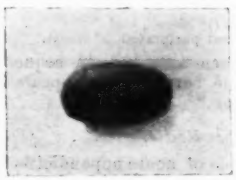
RADIOGRAMS OF NORMAL APPENDICES.

RADIOGRAMS OF DISEASED APPENDICES.



RADIOGRAMS OF DISEASED APPENDICES.

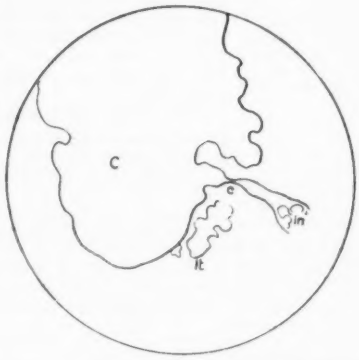
We may summarise the above by saying that the signs of present inflammation are, in addition to pain and other clinical symptoms, a tender point and varying dilatation of the lumen from hyperactivity and spasm, whilst evidence of former disease, recent or remote, is given by concretions, abnormal outline, delay in filling or emptying, adhesions, severe kinks, and, in certain cases at least, by the absence of a shadow.



Photograph of concretion from Case 2. See Fig. 14, also coloured drawing.

Figures traced from Additional Photographs in Cases 1 and 7.

13A



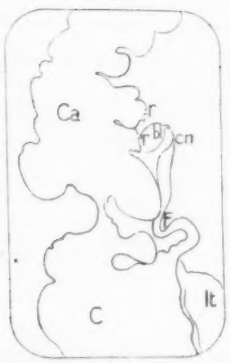
CASE 1.—After 10 hours. C, Cæcum. c, Contraction of proximal part as compared with Fig. 13. in, Inopaque material in first bulb. It, Coating in ileal terminal.

19A

CASE 7.—After 8 hours. C, Cæcum. It, Ileal terminal. h, Beginning hook appearance.

Explanatory Diagrams to Figs. 14, 17, and 26 (Diseased Appendices).

14



CASE 2.—C, Cæcum. Ca, Ascending colon. It, Ileal terminal. bl, Bulb containing concretion. cn, Constriction. f, Fixed portion of loop. r, Ragged outline.

17

CASE 5.—Ab, Appendix base. Abt, Its bulbous tip. Ap, Its proximal portion. b, Diffuse appearance of barium traversing the first bulb. k, Site of kinking. C, Cæcum.

26

CASE 17.—A, Appendix. Ab, Its base. C, Cæcum. in, Inopaque material. I, Ileum. Itd, Dilated ileal terminal. Ito, Obstructed ileal terminal. k, Site of kinking if erect posture is assumed. r, Ragged outline of terminal; site of adhesion to cæcum.

Of the last 100 cases examined, in 40 the appendix appeared to be normal, though one of these showed tenderness. This was the case above mentioned, in which the patient was ill owing to a growth of the stomach. In 19 cases the appendix was reported diseased; 11 of these have already been operated upon and the diagnosis confirmed. In 27 slighter abnormalities were found, such as appendical stasis (18 cases), kinking, fixation, partial obliteration or diminution of lumen. In the remaining 14 the appendix was not seen. One of these has been operated upon and a constriction found at the base of the appendix.

We wish to express our thanks to the surgeons who have kindly informed us of the condition of the appendices excised by them, especially to Dr. Manson Fergusson, of Banff (17 cases), Dr. J. C. Galloway, of Banff (5 cases), and Professor J. Marnoch, of Aberdeen University (7 cases). We are also indebted to Mr. Gilbert Barling, Sir Arbuthnot Lane, Mr. Hugh Lett, Sir Berkeley Moynihan, Mr. H. S. Pendlebury, Mr. J. H. Pringle, Sir Harold Stiles, and Professor Alexis Thomson.

SUMMARY.

1. It is possible to observe the appendix with the X rays, in the large majority of cases, by the use of an opaque meal of buttermilk and barium sulphate after preparation with castor oil. An account is given of the methods and manipulations which have been found useful in the examination of 300 appendices.

2. The normal appendix fills and empties about the same time as the cæcum. It may, especially in young people, fill and empty repeatedly, while the cæcum remains full. The best view is usually obtained about 12 to 14 hours after the opaque meal. Twelve photographs of normal appendices are shown.

3. Direct X ray examination of the appendix is of much help in the diagnosis of chronic appendicitis. With adequate observation it is found that the proportion of cases in which no barium sulphate enters the appendix is small.

4. In determining whether the appendix is or has been diseased attention must be paid to filling and emptying, shape, mobility, position, and the presence of concretions, hyperactivity, spasm, or tenderness. Continued contractions and spasm are associated with active inflammation. The existence of a tender point is a valuable sign, but requires care in its interpretation.

5. Details are given of 36 cases in which the X ray reports are compared with the operative findings. In all of these the diagnosis was verified at the operation. Twenty-three photographs of diseased appendices are shown and eight coloured drawings of appendices after removal.

References.—(The list includes some papers which are not referred to by name in the text.) 1. Béclère: Bull. de Soc. de Radiol., 1909, i., 192. 2. Carman and Miller: The Roentgen Diagnosis of Diseases of the Alimentary Canal, Philad. and Lond., 1917. 3. Case, J. T.: New York Med. Journ., 1914, c., 161. 4. Cohn, M.: Deutsch. med. Wochenschr.,

(Continued at foot of next page.)

ACUTE APPENDICITIS AND ACUTE APPENDICULAR OBSTRUCTION.

BY S. T. IRWIN, M.CH. BELF., F.R.C.S. EDIN.,

ASSISTANT TO PROFESSOR OF SURGERY, QUEEN'S UNIVERSITY, BELFAST; TEMPORARY ASSISTANT SURGEON, ROYAL VICTORIA HOSPITAL, BELFAST; SURGEON, ULSTER HOSPITAL, AND MILITARY ORTHOPÆDIC HOSPITAL, BELFAST; TEMP. CAPTAIN, R.A.M.C.

(*With Coloured Illustrations.*)

Introduction.

IT is the aim of this paper to analyse the results following upon 131 consecutive urgent operations for acute disease of the appendix; to discuss and, if possible, to elucidate some of the apparent incongruities between physical signs and pathological findings; to offer some observations upon the variations in the anamnesis; and, last of all, to direct special attention to a large and homogeneous class of case in which the origin of the disease and its morbid anatomy are primarily and directly due to obstruction.

This list of cases includes operations performed in the most unpromising surgical surroundings, both in respect of the operation itself and of the subsequent nursing, though there seems to be often more risk in the removal of a patient in certain types of the disease than in operating where few facilities are at hand and many things must be improvised. It is not the actual operation which is severely handicapped, but rather the subsequent nursing of the case—if, for example, it be found necessary, as indeed it often is in such cases, to drain the abdominal cavity. Removal of a patient may entail serious risks in that (1) it delays the operation; (2) it may provoke rupture of a thin-walled gangrenous appendix; (3) it may cause a localised abscess to burst and thus infect the general peritoneal fluid; or (4) it may cause direct extension of infective material into the subphrenic region. Where removal must be faced this should be carried out in the Fowler position (Crawford Renton).

Let me call attention here to the frequency with which pus is met with in cases demanding surgical interference. Out of the 131 cases, no less than 84 had already gone on to suppuration. It was Finney who said:—

"The presence of pus in an appendicitis operation is *prima facie* evidence of a mistake on the part of somebody, the patient, the physician, or the surgeon."

In my own series all excepting one, and that one already perforated, were operated on as soon as seen. In my opinion pus is due not so much to a failure to recognise that the appendix is at fault as to a failure to recognise by its symptoms and signs the grave type of the disease in its early stage. And this suggests the question of diagnosis—often easy, but not seldom difficult, and at times well-nigh impossible. It is not enough to arrive at the conclusion in any case that the appendix is at fault, though this is, of course, the first step, but we should also aim at deciding whether it be a case of (1) acute appendicitis or (2) acute appendicular obstruction. If the latter, what is the condition of the appendix wall? Is it gangrenous, with perforation imminent? or has perforation already occurred and is there pus present, and, if so, is the pus encapsuled or is there infection of the general peritoneal contents?

If the appendix be gangrenous, and if perforation be close at hand, then only the gravest disadvantages will justify delay in operating. Mr. Robert Campbell, in first directing attention to acute appendicular obstruction, showed what a dangerous form of the disease it was—that it has a definite course, extending usually for a period of not less than 36 hours before perforation, and after perforation it has a very grave issue, for the contents of the distended appendix are under considerable pressure, and when rupture occurs the pus is often sprayed far and wide throughout the general peritoneal cavity. It was to this type of the disease, doubtless, that Sir Berkeley Moynihan referred in his vivid picture of the effect of the homely dose of castor-oil which usually anticipates by some hours the arrival of the surgeon, precipitating a calamity which it is his aim to avert, and transforming an aseptic operation field into a veritable quagmire.

The series under review has been divided up as follows:—

1. True acute appendicitis—34 cases.
2. Indefinite—10 cases, which from insufficiency of evidence I was unable to classify either as inflammatory or obstructive.
3. Acute appendicular obstruction—87 cases, which have been subdivided further into—
   Stage I. Obstructed only (10 cases);
   Stage II. Obstructed and gangrenous (18 cases); and
   Stage III. Obstructed, gangrenous, and perforated (59 cases).

Each group of cases has been arranged in sequence according to the interval of time between the appearance of symptoms and time of operation.*

True Acute Appendicitis.

The following case is an example of acute appendicitis:—

CASE 30.—Patient, man aged 24, otherwise healthy, was seen with Dr. G. F. Campbell on July 17th, 1913. He had taken ill about eight days before, with feeling of sickness, especially after meals. No actual vomiting; nausea persistent and distressing. The bowels became sluggish. He had a varying amount of pain, worse in evening and at night, and sometimes had to be relieved by poulticing. He had suffered from indigestion for some years. Pulse was 100, temperature 99° F. There was a tender point just internal to anterior superior spine on the right side; small phlegmon present. Operation through right rectus incision; appendix inflamed with thickened walls, lying external to cæcum and buried in plastic lymph. No pus; abdomen closed in layers without drainage.

I would especially direct attention to the indefinite onset, to the absence of any great pain as initial symptom, and to the absence of troublesome constipation. Many of these cases, however, go on to suppuration. These are cases of acute appendicitis in which, from the onset, the temperature and the pulse are elevated, and in which pain, though present, is not of such a severe type as in the cases due to obstruction, and even from its first beginnings is definitely localised to the right iliac fossa. In these cases, too, vomiting and constipation are not troublesome, and if pus be present it is small in amount and well walled off by the surrounding organs, which are adherent to the appendix and the cæcum. The walls of the appendix are thick and fleshy and there is no distension of its cavity.

In this, the commonest type of acute appendicitis, if perforation occurs it is of less importance than in the obstructive cases for two reasons: (1) There is but little material within the appendix, no distension of its lumen, and therefore no increase of tension; and (2) the appendix is well surrounded by adhesions. Mention must be made, however, of those inflammatory cases in which perforation, if not the first, is an early symptom of disease. In such cases, no doubt, obstruction plays a prominent part, but the group about to be described under the term acute appendicular obstruction is so definite, so large, and so important from the point of view of prognosis that we do not include those cases in it. In one case (No. 2) perforation occurred so early that it can only be explained by antecedent ulceration, which had so thinned the wall that the slightest increase in tension produced rupture.

Indefinite cases.—To this group I do not wish specifically to refer, except to say that so far as they could be examined the more serious cases showed considerable evidence of being primarily obstructive in origin.

Acute Appendicular Obstruction.

I have come across 89 cases of acute appendicular obstruction, of which 10 showed obstruction only, 18 showed obstruction with a varying amount of gangrene of the wall, and in 59 rupture of the appendix had followed the gangrene. A typical case from the third stage of this group is as follows:—

CASE 99.—Youth, aged 19; taken suddenly ill on Dec. 28th, 1915, with very severe pain in stomach; he vomited three times that evening. His bowels till then regular, became constipated. He was seen next morning by Dr. Robert Boyd. Patient complained of pain in left hypochondriac region. Pulse and temperature normal. Slight rigidity over right rectus below. Breath was foul, and tongue thickly coated; otherwise he looked well. The next day he was again seized with a

* From pressure on space, the schedule of cases could not be printed.

(*Continued from preceding page.*)

1913, i., 606. 5. George, A. W., and Gerber, I.: Surg., Gynec., and Obstet., Chicago, 1913, xvii., 418. 6. George, A. W., and Leonard, R. D.: The Roentgen Diagnosis of Surgical Lesions of the Gastro-intestinal Tract, Boston, 1915. 7. Grigorieff: 1911; see Cohn. 8. Groedel, F. M.: Münch. med. Wochenschr, 1913 i., 744. 9. Hurst, A. F.: Arch. Roent. Ray, 1915, xix., 249. 10. Imboden, H. M.: Amer. Jour. Roent., 1915, ii., 581. 11. Jordan, A. C.: Proc. Roy. Soc. Med., 1911, v., El. Sect., 9. 12. Liertz, R.: Deutch. med. Wochenschr., 1910, ii., 1269. 13. Orton, G. H.: Proc. Roy. Soc. Med., 1907–8, i., El. Sect., 29. 14. Quimby, A. J.: New York Med. Journ., 1913, xcviii., 697. 15. Rieder, H.: Münch. med. Wochenschr., 1914, ii., 1492. 16. Villvandré, G.: Arch. Radiol. and Electrother., 1916, xxi., 49. 17. Walsham, H., and Overend, W.: Arch. Radiol. and Electrother., 1916, xx., 260.

sudden severe pain, now localised to right lower abdomen. Temperature 99°, pulse 100. I was asked by Dr. Boyd to see him, and diagnosing a perforated gangrenous appendix, had him removed to the Royal Victoria Hospital, where, through the kindness of Mr. A. B. Mitchell, I was allowed to operate upon him. Operation under open ether; right rectus incision. Appendix found gangrenous for about 2 inches from tip; large perforation, size of a sixpence, lying in abscess cavity containing about an ounce of pus. Appendix removed, cavity drained; good recovery.

The foregoing is a type representative of a very large percentage of the critical cases which a surgeon is called upon to see. They are, so far as my experience goes, the most serious of all the common emergencies in abdominal surgery, and consider for a moment what the pathology of this case was. I make no apology for quoting briefly from the recent experimental work of Mr. D. P. D. Wilkie, who demonstrated the pathological changes which take place in an isolated loop of small intestine into which some cæcal content has been introduced, the loop being completely obstructed and there being no interference with its blood supply:—

"When the loop is filled moderately full with cæcal content, the animal having been fed on a carbohydrate diet (porridge), distension occurs with fœtid fæculo-purulent fluid, and either an empyema of the loop results or a gangrenous patch develops with perforation. ..... With the loop filled with cæcal content in an animal previously fed on a rich protein diet (lights) the changes are much more striking, and as a rule the animal is dead within 20 hours. On opening the abdomen post mortem the loop is seen to be green and gangrenous."

These are the changes which occur in an occluded piece of animal's intestine, and similar changes occur when the human appendix becomes obstructed at or near its base. The lumen beyond the obstruction becomes rapidly distended with fæculo-purulent material and localised patches, or the whole organ may become gangrenous, to be followed later by rupture.

A consideration of Wilkie's experiments, our own experience of the morbid anatomy of cases seen in the earlier stages, and the appearances found at the operation, agree in indicating that in the above case the symptoms arose from an obstruction near the base of the appendix; that there was present within the appendix a certain amount of fæculent matter; that this obstruction led to gangrene of the appendix; and that, following the gangrene, perforation had supervened. If, then, this be the pathology, and if the appalling mortality in acute diseases of the appendix be due to this type of case, then obviously the remedy lies in diagnosing the condition before perforation occurs; in other words, had one been able to foresee that, in spite of the normal temperature and normal pulse, there lay interned within his abdominal cavity a sloughing appendix, then no excuse would have justified us in allowing perforation to take place.

That this is no unusual type of case, and that symptoms and signs are often unalarming on the second day, numerous arguments and examples go to prove. Here is another:—

CASE 100.—On Dec. 8th, 1914, at the Royal Victoria Hospital, I was asked by Mr. A. Fullerton to operate upon a boy, aged 10, just admitted to hospital. He had taken ill on Dec. 6th. He had been seen on the second day by his own doctor, who was present at the operation, and who told me that the boy suffered considerable pain on Dec 6th but on the 7th he was so much better that he thought that he might be able to do without operation. On the night of Dec. 7th he was again attacked by acute pain, and when the doctor saw him next morning he sent him straight into hospital. On admission temperature 98°, pulse 122. Large area of dullness present on right lower abdomen. Operated on by gridiron incision, pus released, and tube placed in abscess cavity.

The boy's condition precluded the removal of the appendix, but there can be no reasonable doubt that this case was identical with the one already quoted.

Causation of Obstruction of Appendix.

In these obstructive cases it is our contention that the primary cause of the disease is obstruction of the lumen of the appendix. On examination of the appendices removed at operation it is found that obstruction may be due to one of five causes:—(1) Concretions; (2) strictures; (3) kinks; (4) bands; (5) worms, fruit-seeds, and other foreign bodies.

Concretions are by far the commonest form of obstruction, especially in those cases which go on to the production of gangrene: in my series they were present in about 50 out of 87 obstructed cases. In cases of completely gangrenous appendix coproliths will be found dividing the healthy from the diseased portion, and in the early stages where gangrene is not evident outside it will be found on opening the appendix that the mucous membrane of the distal portion is sloughing. It is no uncommon thing to find, besides the obstructing concretions, several others lying within the cavity of the appendix. After perforation one or more concretions may escape into the abscess sac, and in one case (No. 119) the abdominal wound healed completely over such a foreign body, which was only found at the subsequent operation for the removal of the appendix.

The exact relationship of these concretions to the disease has not hitherto been definitely established. In our opinion they are the definite *causa causans* of the particular form of the disease now under discussion. They act by suddenly blocking the lumen of the appendix and, by preventing the return of the contents of the appendix into the cæcum, give rise to the acute symptoms of pain in the upper abdomen and vomiting already referred to. If the obstruction be not relieved, and more especially, as has been shown by Wilkie, if the patient has been fed chiefly on proteid food, the vitality of the appendix rapidly falls, and in from 30 to 40 hours sloughing supervenes.

Strictures.—The second form of obstruction to which I would direct attention is stricture, of which at least six examples were met with. I first observed this in Case 54. I find that strictures of the appendix have been well recognised and described for many years, notably by Abbé, of New York, and others. These have been attributed by Runyon, as quoted by Kelly and Hurdon, to previous attacks of appendicitis with ulceration, in which the mucous lining of the appendix has been destroyed. In Case 54 the boy had never previously suffered from any form of disease, and it may therefore be an example of what Lenzmann and Ewald have described as appendicitis larvata. It adds a further argument to the hypothesis of obstruction by proving that inflammatory changes, even to the extent of ulceration, may take place without arousing the suspicion of disease in the mind of the patient.

I saw another case in which stricture and concretions were combined. This was Case 69, in which an ordinary third-day perforated gangrenous appendix was found. I showed this to Professor J. Symington, and on his advice it was first hardened in formalin, then cut with a razor till we found the exact position of the stricture. This strictured area we then prepared in the ordinary way for microscopical examination. It showed a mass of newly formed granulative tissue filling up the lumen of the appendix. It was continuous with the submucous coat and no trace of mucous membrane could be found. Since then Dr. W. W. D. Thomson has kindly investigated the appendix from Case 82.

This was a typical case in which soon after the administration of a dose of castor oil on the second day the patient, a boy of 16½ years, was suddenly seized with pain in the right iliac region. Next day, at operation, we found an appendix obstructed by two complete strictures. Between the strictures the appendix was completely gangrenous and at one point a perforation big enough to admit a slate pencil was found.

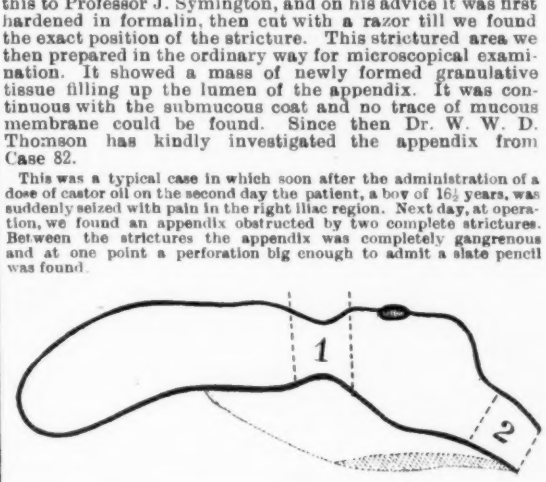


FIG. 1.—Outline drawing of an appendix showing position of two complete strictures at 1 and 2.

A line drawing of this appendix is shown in Fig. 1, and Dr. Thomson has gone fully into its pathology and reports as follows:—

Naked-eye appearance.—The cavity of the appendix is divided by two strictures into three compartments. The proximal compartment is continuous with the cavity of the cæcum. Its mucous lining and submucous tissue are alike normal. The middle compartment is completely gangrenous and perforated. The distal compartment is full of pus.

Microscopic appearances.—Serial sections were prepared.—

1. The strictures are both complete. Each is formed of a dense mass of granulation tissue which completely replaces the lumen, epithelial lining, and mucous coat of the appendix. It is continuous with the submucous layer. A photomicrograph of this section is shown in Fig. 2.
2. A section through the middle compartment shows necrosis of all the layers of the appendix, with a ragged perforation at one point.
3. The terminal compartment is swollen, tense, and filled with purulent material swarming with *Bacilli coli*.

Kinks.—The third form of obstruction is that due to a kink which is produced by the contraction of an adhesion between two adjacent parts of the appendix. In this way a sharp angularity is formed. Both ends of the adhesion take their attachment from the appendix.

Bands.—A similar angularity may be caused by a band one end of which is adherent either to the parietal peritoneum or other part of the alimentary canal and the other to a proximal part of the appendix Contraction of this

band causes the appendix to be drawn out to a sharp angle which interferes with the free passage of the appendicular contents.

In obstruction due to bands and kinks the progress of morbid change is generally slower than in the case of concretions, and so, by giving time for the production of protective adhesions, lessens somewhat the gravity of peritonitis, if and when it appears.

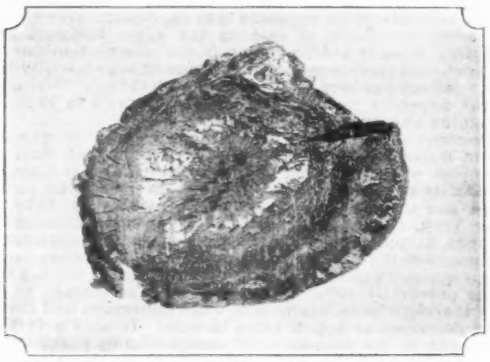


FIG. 2.—Section through stricture at 2. Photo-micrograph.

Foreign bodies, such as intestinal worms, fruit-seeds, &c., are rare forms of obstruction.

Stages of Acute Appendicular Obstruction, with Illustrations.

The late Mr. Edmund Owen, in his book "Appendicitis," makes the deliberate statement that no surgeon of experience pays much attention to history. Rarely can such a statement be justified, least of all in acute disease of the appendix in which there is a well-defined sequence of events and a very definite symptom-complex. It is this symptom-complex which I wish to consider now, and by comparing it with appendices removed at the different stages of the diseases to correlate symptoms and signs with pathological findings. There may still be some doubt as to whether in any particular case obstruction did or did not exist in the case of bands or kinks; no such doubt can arise with a concretion which blocks like a ball-valve the appendicular canal. All the examples which I show depend on this cause for the obstruction. Fig. 3 shows a typically obstructed appendix. It is a section of the appendix from Case 58, distended with gelatin and cut longitudinally.

It is difficult from a consideration of preserved specimens to get even the faintest idea of the course and stages of the disease owing to the rapidity with which the characteristic colours disappear and to the fact that no known method of mounting will preserve these delicate colourings. Again I am indebted to Professor Symington for suggesting that these specimens should be drawn to scale and coloured immediately after removal from the abdomen. This course I have followed, and I think the illustrations show in conclusive fashion the morbid changes through which the obstructed appendix passes, and by comparing these with the history and clinical signs we are able to arrive at an accurate estimate of the intra-abdominal condition in any given case.

Stage I.—Coloured Illustration I. is from a coloured drawing of an appendix removed 21 hours after the onset of symptoms (Case 46). (See Coloured Illustrations inset.)

CASE 46.—A man, aged 45, a patient of Dr. W. McWilliam of Banbridge, took ill at 3 A.M. on Oct. 2nd, 1915, and was operated on about midnight. The attack began with very severe pain in the upper abdomen referred to region of umbilicus. Vomiting took place at short intervals throughout day. Pulse and temperature normal. Considerable rigidity in right rectus muscle and tenderness localised to small area immediately below McBurney's point. When I saw him temperature was 98·6°, pulse 84, tongue clean, and breath not foul. The pain was of a colicky character, and between the attacks he was quite comfortable. Small area of tenderness as above stated; otherwise abdomen normal. The diagnosis of obstructed appendix was made and appendicectomy performed. On opening abdomen no sign of inflammation; appendix tense and rigid; concretion felt close to proximal end. Appendix removed. Uninterrupted and rapid recovery.

This is a typical example of the first stage of obstruction of the appendix. There are no signs either local or general of inflammation. There are 10 such cases in the series and results of treatment by operation leave nothing to be desired. The period of disability is short and the risks of complications and sequelæ almost nil. And yet if left to nature or if treated on medical lines a certain proportion of them will proceed in the direction of gangrene and perforation as exemplified in the succeeding stages.

Stage II.—In the following case operation was performed 24 hours after first symptom.

CASE 55.—Patient, a young woman aged 21, was seen by Dr. W. Martin of Whitehead, on the night of July 10th; history of having been ill with pains in stomach and vomiting for six hours. Temperature and pulse normal; no sign of any trouble in abdomen. He saw her again next day; temperature 100° and pulse 100; he sent her straight into hospital. At operation an appendix obstructed by a concretion at its base was found; very small area of gangrene on one side of organ. (Fig. 4.) Recovery in this case was retarded, as it frequently is in cases of gangrenous appendix, by infection of the layers of the abdominal wall, but the patient ultimately made a satisfactory recovery.

Here we have an appendix exactly similar to the first, but somewhat later in the course of the disease, and it seems reasonable to conclude that this is the second stage of the disease which follows obstruction.

The next case is that of a patient operated on 30 hours after the onset of symptoms. (Coloured Illustration II.)

CASE 58.—A woman aged 35, a patient of Mr. W. Boyd, of Banbridge, took ill at 9.30 P.M. on April 2nd, 1915, with pain in epigastric region and vomiting; symptoms lasted continuously for 12 hours. When Mr. Boyd saw her temperature and pulse were normal; no pain, tenderness, or rigidity in any part of abdomen. Four hours later pain had returned, not now in epigastric region, but in right iliac fossa. Temperature now 101·2 and pulse 104. When I saw her about 12 hours later (that is 30 hours after onset) temperature was 101°, pulse 108; there was extreme tenderness not only over appendix, but over whole lower abdomen. Fig. 3 and Coloured Illustration II. are from drawings of the appendix which was removed. On opening the abdomen a huge, tense, obstructed appendix was found. During manipulations a concretion was felt to escape into the cæcum, and when the appendix was afterwards distended with gelatin a cavity corresponding to this became evident. The appendix contained a number of small concretions and a large quantity of foul pus mixed with fæcal matter. There were two considerable areas of gangrene. Recovery uneventful; patient left hospital in four weeks.

Here let me direct attention first of all to the absence of symptoms and signs when first seen by Mr. Boyd, and, secondly, to the moderate rise of temperature and pulse with the appearance of gangrene. This is the further stage in a disease caused by an obstruction.

The next case was operated on 31 hours after the onset of symptoms.

CASE 59.—Man, aged 35, a patient of Dr. G. F. Campbell, of Bangor, took ill on Dec. 21st, 1915, with severe pain over "lower end of breast bone," and vomiting. Similar attack two years before. After 12 hours the pain began to settle in right side about 1 inch above McBurney's point. Thirty-one hours after onset tongue was clean, temperature 100·4, pulse 80; abdomen showed a single tender spot; right rectus muscle somewhat rigid, but not markedly so. Operation immediately by gridiron incision. There were some adhesions, but without difficulty the appendix, completely gangrenous, was removed. (Fig. 5.) Stump of appendix could not be invaginated, but was simply ligatured in abdomen.

The appendix was a typically obstructed one in which the whole organ was obstructed, distended, and gangrenous. This man before being operated on declared that he was getting over the attack just as he had got over the previous one, and one could not from clinical signs have denied the possibility of this, and yet we find this foul gangrenous appendix with perforation imminent. It is difficult to decide why in the previously mentioned cases one or two areas of gangrene occur, whilst in this case the whole organ was affected.

Coloured Illustration II. is an example of an unperforated gangrenous appendix, of which there were 18 in the series. They all recovered, though they are somewhat less satisfactory than the foregoing, and mainly for two reasons: (1) a few of them required drainage owing to the suspicion of infection of the peritoneal fluid, and therefore ran the risk of hernia; (2) even in the absence of peritoneal infection there is considerable liability to infection of the abdominal wall, a fact previously pointed out by Mitchell and others. On the whole, prognosis is rarely grave in this series.

Stage III.—Coloured Illustration III. shows the condition of the appendix at a later period.

CASE 90.—Patient, a woman aged 47, seen with Dr. R. Boyd, of Strandtown, on Oct. 12th, 1915, had already been ill three days. Examination showed a well-defined mass in the right iliac fossa and on right side of pelvis. Temperature 101·5°; pulse 108. She was at once sent to hospital and operated upon. There was an abscess of considerable size situated in right iliac fossa and extending down into right side of pelvis. Appendix gangrenous and perforated; and about 1½ inches from base obstructed by large concretion; also concretion in abscess cavity.

This is unfortunately the usual type which one meets with at operation, but the previous history shows that it began with the same early symptoms of vomiting and pain in the upper abdomen; after 24 hours pain in the iliac fossa as

secondary inflammatory changes reach the peritoneal coat of the appendix; after 36 hours perforation ushers in suppurative peritonitis, and soon a large abscess extending into the pelvis has developed.

This is a type of the 59 obstructed, gangrenous, and perforated appendices occurring in Stage III. A consideration of their histories shows that most of them were seen during the second stage, and not a few of them even in the first stage. As a profession, therefore, we cannot absolve ourselves from responsibility for failing to recognise, or at all events to prevent, the dangerous course of the disease.

First, and most important, look at the death-rate—8 deaths out of 59 cases, 13·5 per cent. It may be urged by some that such a high mortality was due to immediate operation. In only one case can I think, on looking back, that I might have been justified in postponing operation (No. 102, a child aged 2½ years), though, on the other hand, there would certainly have been also the opposite possibility that the child would in 12 hours have been moribund. Of the other deaths two, Nos. 40 and 114, were due to rupture of a localised abscess into the general peritoneal cavity—a most fatal complication and one directly due to delay in operating. Two died of pneumonia, which could not have been foreseen. One death was due to acute intestinal obstruction (No. 95), which had gone on well for a fortnight, the temperature and pulse having been normal for ten days. Three cases, Nos. 87, 97, and 106, all children, were moribund on admission to hospital—they had their abscesses opened under local anæsthesia, though they were past all but the remotest chance of recovery. What evidence is there here for further delay when at least five of the cases had already been delayed too long, viz., the three last mentioned and the two cases of ruptured abscess?

So much for the death-rate. Let us now look at the complications—secondary abscess, fæcal fistula, hernia, pneumonia, &c.; of such the earlier cases are free. Then one must consider prolonged convalescence, the semi-invalidism, and the incapacity for work which follow these.

Typical Case of Obstruction of the Appendix.

Keeping in mind these stages, let us now endeavour to reconstruct a typical case of acute appendicular obstruction, from the onset of symptoms until perforative peritonitis occurs.

The disease begins with severe pain usually referred to the epigastric or umbilical region; it is colicky in character and is very severe, it is soon succeeded by vomiting which, though occasionally absent, is usually a prominent feature, and recurs from time to time as the patient tries to relieve his thirst. Constipation is usually a prominent feature. These are the symptoms of the first stage—as for signs, the temperature rarely exceeds 99°, the pulse may show a slight increase in frequency, though it is often normal, and between the attacks of pain the patient is comfortable. On examination of the abdomen some tenderness will be found when pressure is made over the distended appendix, but the rectus shows but little rigidity. Operation at this stage reveals an appendix tense, rigid, and distended, as exemplified by Coloured Illustration I.

Twenty-fours later, if the obstruction persists, we shall find diminution of pain, with disappearance of vomiting. The temperature and pulse are now slightly elevated, the temperature being, say, 99° to 100° and the pulse 110. An examination of the abdomen shows not only an area of extreme tenderness near McBurney's point, but also a wide area of rigidity. Operation reveals an appendix partially or wholly gangrenous, surrounded by a varying amount of plastic lymph gluing it to the neighbouring organs. Sometimes the omentum will be found wrapped round the diseased organ and closing off the general peritoneal cavity, which contains an excess of fluid. If such were the circumstances surrounding every perforation the outlook would not be so gloomy, but often we find no omental sentry on patrol, and when rupture occurs the line is broken and extensive invasion of the peritoneum takes place. Figs. 4 and 5 and Coloured Illustration II. are examples of this stage.

FIG. 3.—Longitudinal section of appendix obstructed by concretion and containing concretions.

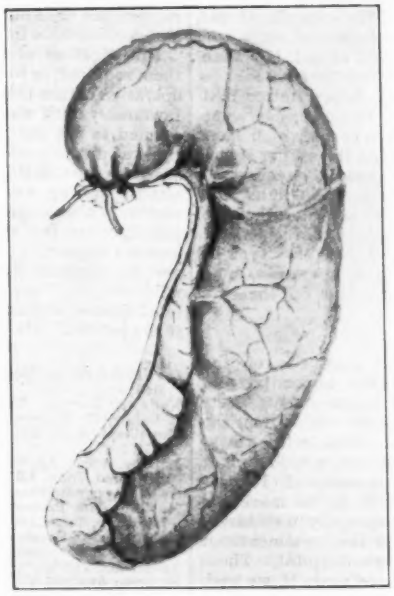


FIG. 4.—Obstructed and gangrenous appendix.

FIG. 5.—Obstructed and completely gangrenous appendix.

When rupture of the gangrenous appendix and infection of the peritoneal fluid have occurred we shall find a further attack of pain, this time referred to the right iliac fossa, continuous in character and often more severe even than the pain in the original obstruction. Vomiting is not a marked feature of this stage, though a feeling of sickness or slight vomiting may occur. Constipation is still present. At the moment of perforation the temperature may fall to sub-normal, but soon begins to rise again, except in very grave cases, and the pulse is greatly accelerated, running up to perhaps 120, or even more. Examination of the abdomen reveals a board-like rigidity of the muscles over the whole of the right side of the abdomen; the point of maximum tenderness will depend upon the situation of the ruptured appendix. Operation will show either a localised collection of pus or a general peritonitis dependent on whether the material from the appendix has been limited or not. Coloured Illustration III. is an example of an appendix from such a case.

These outlines may be regarded as the ordinary signs and symptoms of a case of obstructed appendix, but certain exceptions must not be lost sight of.

For example, in the case of an appendix which is lying in the pelvis it is not unusual to find both signs and symptoms referred even from the first to the pelvic region, or even to find a gangrenous appendix in the pelvis without definite

symptoms suggestive of an appendix disease at all. In such cases we have to depend on the history of an acute onset, painful micturition, and localised tenderness and swelling on vaginal or rectal examination.

A retrocæcal appendix becoming obstructed produces at first the typical symptoms of pain and vomiting referred to the upper abdomen, but afterwards the pain and tenderness are referred to the flank, or even to the site of renal pain beneath the last rib.

Where the appendix is adherent to the anterior abdominal wall tenderness and rigidity are more marked than when the anterior parietal peritoneum is unaffected.

Is pain ever absent in these cases? Probably it is never absent throughout the attack, but pain and discomfort frequently disappear when gangrene is developing and when rupture is becoming imminent. Comparable to this phenomenon is the disappearances of pain in a strangulated hernia when the gut is becoming gangrenous. Vomiting is a characteristic feature of the early stage of obstruction of the appendix. It is not so severe as in intestinal obstruction, is never fæcal, and after the stomach has been emptied is only provoked by the taking of something to relieve thirst. In the late stages of peritonitis, however, the vomiting may be continuous and not infrequently gives place to hiccough.

It will thus be seen that perforation of the appendix in the great majority of cases is preceded by well-defined signs and symptoms, extending usually to a period of not less than 36 hours, and of so definite a character that there should be no excuse for allowing a case to proceed to perforation if it be seen during this preliminary period. There may be some doubt as to the right course to pursue in cases which have already reached Stage III., but in regard to the earlier stages there can be no question that such cases should be operated on without delay, and where the history and the signs lead one to suppose that perforation is near at hand then no delay or disturbance of the patient should be permitted until *after* the appendix has been removed. In this type of case the presence of pus, far from justifying operation, must be taken as incriminating some one responsible for the care of the patient.

Prognosis.

Within recent years discussion has been rife on the mortality following acute disease of the appendix, and without doubt the figures are showing improvement. Lett compares two series of a thousand cases each from the London Hospital: in 1900–1904 and in 1912, with death-rates of 17·2 and 3·2 per cent. respectively—a reduction of 14 per cent. These results take no cognisance of (1) cases moribund on admission and (2) cases too ill to be moved to hospital—a not inconsiderable number, especially in children. In 1910 Mutch analysed the results of the treatment not necessarily operative, of 545 cases at Guy's Hospital. These gave a mortality of 13 per cent. But here again if we wish to get at the general mortality rate we must allow for those cases which died before removal to hospital was thought of or at all events effected. More recent results will be better, but still it must be admitted that appendicitis (using the term in its generally accepted meaning) is a very lethal disease.

How can this appalling death-roll be reduced? This leads me to ask the further question—What is the direct cause of death in this disease? To this the answer is suppuration. The truth of this has been proved repeatedly. A. B. Mitchell in 1910 analysed the results of 500 consecutive operations for appendicitis at the Royal Victoria Hospital, Belfast; although the total mortality ran up to 15 per cent. yet no single death occurred in a non-suppurative case. In 1910 Anderson reported the results of 973 operations at the Nottingham General Hospital; out of 89 deaths, only 1 occurred in the absence of pus. Burgess out of 500 consecutive operations at the Manchester Royal Infirmary in 1912 found but one death where the inflammation was limited to the appendix. In the series here under review no death followed operation in a clean case. Amongst cases already suppurating I find the following figures (in some cases approximate):—

Operator.	Sup.* cases.	Deaths.	Operator.	Sup.* cases.	Deaths.
†Beatson ...	73 ...	9 (12·3%)	Paterson ...	56 ...	5 (8·9%)
Billington ...	360 ...	48 (13·3%)	Richardson ...	350 ...	48 (13·7%)
Burgess ...	365 ...	39 (10·6%)	Irwin	84 ...	10 (11·9%)

* Suppurative.

† Assumes deaths to have been amongst suppurative cases.

Under modern methods, therefore, whilst the mortality in clean cases is practically negligible, and whilst the results in suppurative cases will vary with the dexterity, technique, and sometimes the rapidity of the operator, as well as the subsequent care bestowed on the nursing of the patient, widespread and general improvement can only be attained by intelligent recognition on the part of the practitioner of those cases which are likely to go on to pus formation.

If, then, pus be the cause of death, the cause of pus is perforation of the appendix. In the present series perforation was present in 50 per cent. of the cases. Perforation cannot, I fear, be anticipated in every case. In two cases of the series, Nos. 2–3, it was the perforation which directly caused the symptoms for which the medical man was consulted, and speaking generally we shall meet from time to time cases in whom inflammatory changes have been going on without the knowledge of the patient. Such perforations, though of small size, are most sudden in onset. They compel attention and demand immediate surgical interference, and hence their death-rate is low. Not so the perforation of acute appendicular obstruction, which, after causing considerable pain at first, enters upon a semi-quiescent stage only to perforate later. The perforation is extensive and ragged, the material extravasated is foul, virulently infective, and considerable in amount.

Investigation of the cases shows that no less than 28 of them required, or were thought by the practitioner to require, operation on the third day. These appeared to be progressing favourably until about 36 hours after the onset, when they seemed to get suddenly worse. There can be no doubt that this was due to perforation. The problem, therefore, is, How shall we best anticipate this grave complication? Not by blindly waiting and trusting to the fact that many cases recover without operation, but by teaching our students and practitioners the morbid anatomy of the obstructed gangrenous appendix, that it may be recognised by its history and its physical signs and symptoms, that it is never "a mild attack of appendicitis," but a grave and potentially fatal disease, demanding promptitude and careful handling if the patient's life is not to be placed in jeopardy.

References.

Crawford Renton: Mortality after Operations for Appendicitis, Brit. Med. Jour., 1912, i.

Kelly and Hurdon: The Vermiform Appendix, 1905.

R. Campbell: Transactions of Ulster Medical Society, 1912-13.

Moynihan: Acute Emergencies of Abdominal Disease, Brit. Med. Jour., 1911, i.

Wilkie: Acute Appendicitis and Acute Appendicular Obstruction, Brit. Med. Jour., 1914, ii.

Owen: Appendicitis—A Plea for Immediate Operation, 1914.

H. Lett: The Present Position of Acute Appendicitis and its Complications, THE LANCET, 1914, i., 295.

Mutch: Guy's Hospital Reports, 1910.

A. B. Mitchell: Transactions of Ulster Medical Society, 1910.

Anderson: The Mortality of Appendicitis, Brit. Med. Jour., 1910, ii.

Burgess: Analysis of 500 Consecutive Operations for Acute Appendicitis, Brit. Med. Jour., 1912, i.

Beatson: The Treatment of Acute Appendicitis—When and How to Operate, THE LANCET, 1912, i., 1253.

Billington: The Influence of Age and Type of Patient upon the Course and Treatment of Appendicitis, Brit. Med. Jour., 1912, i.

Paterson: Acute Appendicitis—A Plea for Early Operation, Brit. Med. Jour., 1912, ii.

Richardson: The Results of Operations upon 619 Cases of Appendicitis, Brit. Med. Jour., 1912, ii.

GIFT TO THE NORTHAMPTON GENERAL HOSPITAL.—Mr. G. T. Hawkins, of Northampton, has given £3000 towards the building and equipment of a pathological laboratory for Northampton General Hospital. It is hoped that the work of construction will commence almost immediately.

ROYAL SANITARY INSTITUTE.—Courses of lectures and demonstrations for the spring term, 1919, at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., commence next month. A course for sanitary officers will be given on Mondays, Wednesdays, and Fridays, from Feb. 17th to May 2nd, the fee for the first part, which will deal with sanitation generally, being £2 12*s.* 6*d.*, and for the second part, which will deal with food inspection, £1 1*s.* The complete course is £3. On Mondays, Wednesdays, Fridays, and Saturdays (not consecutive) from Feb. 21st to May 2nd there will be a course of lectures for women health visitors, tuberculosis visitors, school nurses, and school teachers, a supplementary course for child-welfare workers beginning on Feb. 24th. The fee is £1 11*s.* 6*d.* in both cases, but the two courses may be taken together at an inclusive fee of £2 12*s.* 6*d.*, 10*s.* 6*d.* of this being carried towards the examination fee. The lecture hour in each case is 6 P.M.

THE CONTROL OF THE UPPER FRAGMENT

IN HIGH FRACTURES OF FEMUR AND HUMERUS BY A NEW FORM OF PELVIC-FEMUR SPLINT AND ARM SPLINT.[1]

BY JOHN ROBERT LEE, M.D., B.S. MELB., F.R.C.S. EDIN.,

MAJOR, R.A.M.C.; OFFICER IN CHARGE, SURGICAL DIVISION, FULHAM MILITARY HOSPITAL, HAMMERSMITH, LONDON, W.

AT Fulham Military Hospital, London, we have had many opportunities of treating fractured femurs and also of seeing the results of treatment in other hospitals, as shown by cases which have been transferred to us The number of cases which come to amputation from sepsis or which join up in bad position with stiff joints is very great. For instance, during last June we had 20 fractured femurs sent over to us from France, where they had been in special hospitals from one to five months; of these, some were in fairly good position and not very septic, several of them were more or less united in bad position, and most of them had sequestra due to trauma and inefficient drainage. It is the fractures of the femur in its middle third that I wish especially to deal with. Ten of the 20 femur cases admitted in June were those of fractures in the upper

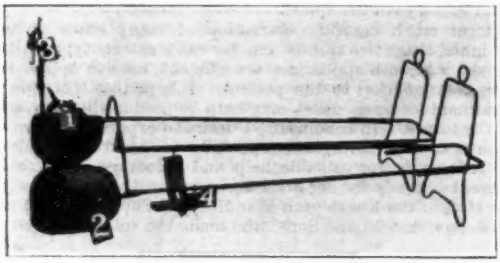


FIG. A.—Pelvic-femur splint.

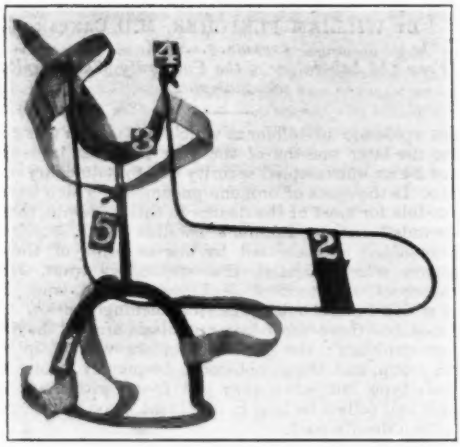


FIG. B.—Arm splint.

third; of these, 3 were in good position and only slightly septic, 2 were in fairly good position but septic, 5 were in bad position, and of these 3 were very septic. Therefore, 50 per cent. were in bad position and 50 per cent. were very septic. These results should be capable of improvement.

Fractures of upper third of femur.—The position or displacement of the fragments in fractures of the upper third of the femur, as a rule, is as follows: (1) The upper fragment is abducted and flexed by the glutei and ilio-psoas muscles; (2) the lower fragment is displaced backwards, upwards, and inwards by the hamstrings, quadriceps and adductor muscles. The powerful adductor magnus being an exceedingly important factor, there is also some rotation. This deformity is typical: the main causes producing it are the direction of the fracturing force and the action of the muscle groups.

The essentials of correct treatment rest on an adequate consideration of the anatomical factors and the principles of

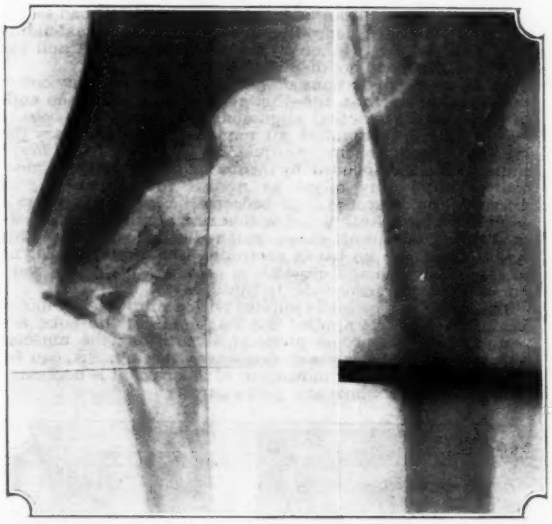


FIG. C.—Radiograms of fracture (compound) of right femur at upper third, with abduction of upper fragment. After application of pelvic-femur splint adduction and fixation of upper fragment with good alignment are seen to result.

surgery, the latter including arrest of hæmorrhage, establishment of efficient drainage, provision for antisepsis, general care of the patient, massage, &c.; I want, however, to draw special attention to the anatomical factors. The fragments should be brought into correct alignment, the muscle groups placed in a condition of physiological rest, and the limb securely fixed in order that there may be no movement of the fragments or spasm of muscles: at the same time any interference with the circulation of the limb should be avoided.

Hitherto it has been taught that in fractures of the upper third "the upper fragment, being short, cannot be controlled." Therefore attempts have been made to procure alignment by abducting the lower fragment. *This method is wrong in principle.* I have taken measurements of a great many men and find that the distance between the symphysis pubis and the adductor tubercle is on an average two inches greater in the abducted position than when the knees are side by side. Hence in the abducted position of the fractured limb the adductor group of muscles have a greatly increased pull and are in a condition of spasm instead of physiological rest. Therefore, although the two fragments are brought parallel to one another, an X ray examination in many cases reveals the fact that the upper end of the lower fragment has now moved upwards a distance of about two inches and takes up a position near the lesser trochanter. An amount of extension that can be applied with safety fails to correct the shortening. Unless the two ends of the bone were impacted what has been accomplished is increased overlapping of the fragments and not an elongation of the adductor muscles. It occurred to me that if the upper fragment could be controlled and the abduction overcome the fragments could be brought into proper alignment with the limb and the muscles in a nearly normal position.

Pelvic-femur splint.—With the above principles in view I designed a new appliance which I have called a pelvic-femur splint.

It consists of a grip with two pads (Fig. A, 1) which fit the pelvis; modified Thomas' frames for both lower extremities are hinged on to the pelvic grip (2). The pelvic grip can be adjusted to fit any pelvis comfortably and securely. The pelvis and upper part of the femur on each side are grasped by the pelvic pads. The abducted upper fragment can be controlled and adducted to its normal position quite easily. (See radiograms, Fig. C.) The amount of pressure required is regulated and the fragment kept in position by a fly nut

[1] Being part of a paper read at the Section of Surgery of the Royal Society of Medicine on Dec. 4th, 1918.

working on a screw (Fig. A, 3). Both limbs can be put up in the iron frames in the ordinary way. The upper fragment having been brought into proper position, the lower one can be placed in correct alignment by abducting or adducting, raising or lowering as required while on the splint, the latter working on hinges or joints (near 2, Fig. A). Any backward displacement can be corrected by manipulating the small wooden splint by means of screws (Fig. A, 4). Adequate extension can be applied. If much extension is found to be necessary an adjustable piece similar to that used in the arm splint (Fig. B) can be fitted from the pelvic pad to the axilla on each side; hence the upward thrust of the extending force will be partly taken by the axillæ and trunk and the pelvic calliper grip not displaced.

All these manipulations should be done on an X ray couch (if necessary under an anæsthetic) so as to *see* that the ends of the bone are in actual alignment, not merely supposed to be so. Having completed all manipulations necessary the binding screws are firmly adjusted. The pelvis and lower limbs can be suspended by means of pulleys on a frame—the patient's body raised as needed for convenience of nursing, the prevention of bedsores, &c. Many patients complain that splints fitted with a ring around the thigh as in a Thomas' splint, cause much discomfort. With this splint there are no bands encircling the limb; hence, no interference with the circulation occurs, which is a very important factor, especially in septic cases.

The splint can be easily applied with a minimum of movement. When it is applied the fragments of the bone are securely held in proper anatomical position; the muscles are at rest. All necessary dressings, nursing, &c., can be carried out, and if any movement of the patient is necessary he is moved as a whole and not in parts.

FIG. D.—G.S.W. of right arm, compound fracture, displacement, upper fragment abducted. After application of arm splint the fragments are shown in good alignment.

The iron leg portion of the splint can be raised at right angles to the operating table, and thus out of the way should any operative procedure be necessary, the upper fragment being perfectly controlled by the grip pad, the lower steadied by an assistant.

The splint is made double to ensure steadiness and to enable the patient to be moved easily. The final result is that the patient lies with the fractured thigh in its proper position comfortably beside the healthy limb. In all cases skiagrams are necessary—both antero-posterior and lateral—in order to show whether the fragments are actually in correct position.

The splint is useful in all fractures below the great trochanter where there is abduction of the upper fragment, but its use is not limited to compound fractures of the femur. It would be of great value in treating fractured pelvis, intracapsular fractures, and anterior poliomyelitis to give rest to paralysed muscles.

Arm splint.—An efficient splint for the upper extremity should be firmly fixed to the patient's body so as to carry the limb and keep the fracture in proper position and at rest. Usually the splint hangs on the limb instead of supporting it.

The splint for the upper extremity which has been designed by me consists of two parts (Fig. B). One fits firmly on to the trunk (1); the other carries the limb (2). The upright trunk part is fitted to the hip with an adjustable piece which allows its upper forked end to be securely fitted into the axilla (3). This part is fastened round the body by two straps. To the upper end of the fork the part which carries the limb is attached by joints (4), which allows the arm to be abducted to any desired angle and retained there. The centre of movement passes through the head of the humerus. By releasing a set screw (5) on the tubular piece the hip portion can be turned round; the limb attachment is then turned completely over; hence the splint can be used for right or left limb equally effectively. The splint can be adjusted so as to support the shoulder in any desired position. The forearm can be placed in either the semiprone or supine position. Provision is made for any necessary extension. When properly fitted the patient carries the upper extremity with the whole weight supported by the body; hence the limb is kept quite steady and at rest. Dressing of wounds, massage, &c., can be carried out without interfering with the splint. (See radiograms, Fig. D.)

After much careful observation of many cases I have designed these two splints, one for each extremity, and have proved that both appliances are efficient, easy to apply, and give great comfort to the patient. I hope that their use in treatment of such cases may help to produce better results in the future. In conclusion, I desire to express my warmest thanks to my colleagues, especially to Lieutenant-Colonel C. T. Parsons, for valuable help and encouragement; to Dr. Florence Stoney for her great assistance with the X rays; to the staff of the Kensington War Hospital Supply Depôt; and to Messrs. Arnold and Sons, who made the splints for me.

MENINGOCOCCUS BRONCHO-PNEUMONIA IN INFLUENZA.

BY WILLIAM FLETCHER, M.D. CANTAB.,
CAPTAIN, R.A.M.C.
(*From the Laboratory of the University War Hospital, Southampton.*)

THE epidemic of influenza which has visited this country during the later months of the year 1918 has been characterised by an unexampled severity due to pulmonary complications. In the cases of broncho-pneumonia, which have been responsible for most of the deaths in this epidemic, the lungs are invaded not by Pfeiffer's bacillus alone, but by that bacillus aided and abetted by one or other of the many organisms which inhabit the respiratory tract, such as pneumococci, streptococci, diphtheria bacilli, and, in the cases which I am about to describe, meningococci.

Sometimes these secondary organisms are, by themselves, of low virulence; the pneumococci are very often of the fourth group, and the streptococci frequently belong to the *viridans* type, but when they join forces with the influenza bacillus and follow its lead in a descent upon the lungs they can play a deadly part.

Bacteriological Findings.

Between Sept. 25th and Nov. 23rd, 1918, cultures were made, after death, from the lungs and from the heart's blood of 36 American soldiers who had died from broncho-pneumonia. These men, for the most part, had been taken ill with symptoms of influenza a week or 10 days before admission to this hospital, while they were on board transports crossing the Atlantic.

In films prepared from the lungs of some of them the only organisms to be seen were Gram-negative diplococci in enormous numbers, the majority of them lying within polynuclear cells. In one or two instances they were so numerous that there was hardly a cell that did not contain some. Plate cultures were made post mortem from the lungs of all the cases; numerous colonies of Gram-negative cocci were obtained in 11 of the 36, and in three instances

they were grown from the heart's blood as well. Sub-cultures of these cocci from seven of the cases were examined at the Central C.-S. Fever Laboratory, with the result that six were found to be Type II. meningococci, while the seventh conformed to Type I. The other four strains were, unfortunately, not kept for further examination, but as, with one exception, they were derived from cases of influenza which occurred on the same transport as the other seven, and as the appearance of the films prepared from the lungs was the same, it is probable that they, too, were meningococci.

In all these 11 cases Pfeiffer's bacillus was present in association with the meningococcus; it was not always found in the films, but it always grew on plate cultures made from the lungs. In two instances pneumococci were also present; in one case streptococci and in another both pneumococci and streptococci were found.

Clinical Features: Condition of Lungs Post Mortem.

The duration of illness from the beginning of the influenza to the end in death was from 11 to 16 days, except in one instance, where the patient lived for 24 days from the date of onset. The men did not reach this hospital until they had been ill for some time, and there are no available clinical records of the course of the disease in its early part. All of them, except one who came from a hospital in France, had been attacked by influenza while on board the transport, and when they were admitted here about a week later they were very ill indeed. Four of them died within 48 hours of admission, 4 within a week, and 3 within a fortnight.

There were no special features by which these meningococcus broncho-pneumonias could be distinguished clinically from the other cases in this ship epidemic which were due to a combined infection with Pfeiffer's bacillus and pneumococci or streptococci, except that in the meningococcus infection there was possibly a greater tendency to hæmoptysis. In one or two of the cases which were seen in the earlier stages the sputum was rusty and tenacious, but for the most part it was nummular, airless pus mixed with dark blood.

In several of the cases an even high temperature was gradually coming down by lysis during the first few days after admission, when it suddenly rose again as though some fresh bacterial invasion had occurred, and instead of remaining steady there were wide oscillations between 99° F. in the morning and 104° or 105° at night. The pulse-rate in these fatal cases increased to 120 or more, and the respirations to about 60. It is noteworthy that in the case of one man, from whose heart and lungs meningococci of Type II. were isolated, the skin was a bright yellow colour for several days before he died. None of the patients showed any signs of meningitis before death took place, nor was any evidence of it seen afterwards.

In every case confluent broncho-pneumonia was found post mortem, producing large areas of consolidation, and both lungs were affected, though generally the process was more advanced on one side than on the other. In two instances red hæmorrhagic patches beneath the pleura were a striking feature, in four the pleura was covered with recent lymph, and in two there was turbid fluid in the pleural cavity.

In some cases the broncho-pneumonic patches coalesced to such an extent that whole lobes were solid and airless, while in others the patches of consolidation remained separate, so that the affected lung felt like a bag of plums. In every case when pressure was applied by squeezing the lung, thick yellow pus oozed from the blocked bronchioles. In one instance there was an abscess with ragged walls at the base of the right lung, which contained a thick, dark, red fluid full of Gram-negative cocci.

Other Observations.

Shortly after the death of these men a British soldier suffering from bronchitis was admitted from France, where he had been under treatment in an American hospital. He had been taken ill suddenly with giddiness and pains in the back 15 days before. His temperature was of the same type as that of the American soldiers who died from meningococcus broncho-pneumonia, swinging from 98° or 99° in the morning to 103° at night, but his pulse was not above 100 and his respirations were never more than 40 to the minute. Films prepared from his sputum, which was frothy and purulent, contained large numbers of Gram-negative cocci, and a plate inoculated with it gave a profuse growth of meningococci of Type IV. and a few staphylococci. This patient's temperature came down by lysis and was normal on the twenty-fifth day.

Lieutenant-Colonel M. H. Gordon, to whom I am greatly indebted for carrying out the agglutination tests on these meningococci, has very kindly drawn my attention to a paper by Jacobitz,[1] who investigated an outbreak of disease which occurred in a Jäger battalion at Colmar during February, 1906. He found two men suffering from typical cerebro-spinal meningitis without complications, three cases of meningitis associated with meningococcus pneumonia, and one case in which there was meningococcus pneumonia without symptoms of meningitis; this last case ended by crisis and recovery. In addition, he observed four cases of bronchial catarrh (with meningococci in the sputum) without any symptoms of meningitis, all of whom recovered. He does not appear to have found Pfeiffer's bacillus in any of his patients.

Summary.

1. In the post-mortem examination of 36 men who had died from broncho-pneumonia following influenza, Gram-negative cocci were the predominant organisms found in the lungs of 11 cases.

2. All the men, with one exception, had been taken ill on board the same transport.

3. In six cases these Gram-negative cocci were Type II. meningococci and in one case they belonged to Type I. In four instances the cocci were not tested by agglutination.

4. In each of the 11 cases Pfeiffer's bacillus was found in symbiosis with the Gram-negative cocci.

5. The meningococcus, like other "respiratory" organisms, may, when it occurs in conjunction with Pfeiffer's bacillus, produce a fatal broncho-pneumonia.

APPARENT IMMUNITY FROM INFLUENZA AT A PUBLIC SCHOOL.

BY G. E. FRIEND, M.R.C.S., L.R.C.P.,
MEDICAL OFFICER, CHRIST'S HOSPITAL SCHOOL, WEST HORSHAM.

IN view of the fact that certain statements have appeared in the public press in reference to the absence of cases of influenza among the 800 odd boys at Christ's Hospital School, West Horsham—which statements were not entirely accurate—it is possible that some authentic account of the local conditions may be of interest.

Incidence in Summer and Winter Terms.

The summer term, which had shown a good health return, ended on July 25th. On Saturday, July 20th, the school cricket XI. went to Brighton to play a match. As a sequel to this visit five of the team became infected with influenza and were admitted to the school infirmary on Sunday morning with 3 other boys who were not in the team but came from the same houses as those who were, and had obviously been infected from them. Only 2 cases were admitted on July 22nd, and 7 on Tuesday, 23rd, 18 on Wednesday, 24th, and 4 cases on the morning of the 25th. There were thus 39 cases occurring as a result of this exposure. Nearly all these boys were from the same houses as the first five. There were during the previous ten days 21 cases of mild influenza occurring in various houses of the 16 that comprise the school, but they were sporadic and milder in type than the 39 later cases. None of these 60 cases were severe, and there was no case with any complication in the school.

Several cases (probably about 30) occurred after the boys arrived home among those who must have been ill on the morning of leaving but who did not report. Every term all the boys are inspected by me on the afternoon of the day before going home, but as they start at 6 A.M. in the morning it is impossible to inspect them nearer the time of departure.

During the holidays the infirmary was washed down and the mattresses and wards used for influenza cases were disinfected. I did not, however, think it necessary to carry out disinfection on a larger scale.

The winter term began on Sept. 13th and ended on Dec. 18th. During the whole term the medical illness was less than it had been in any term since 1898. The total number of medical cases admitted was 115 for 13 weeks. Of these, 36 were "chills"—i.e., cases of illness with raised

[1] Der Diplococcus Meningitidis Cerebrospinalis als Erreger von Erkrankungen der Lunge und Bronchien, Jacobitz, Zeit. f. Hyg., 1907, lvi.

temperatures of 24 hours or more without definite physical signs. The cases occurred sporadically among the 16 houses, and there was nothing in their distribution or incidence to suggest that they were anything more than the ordinary so-called "chill."

Preventive Measures.

After the experience of the summer term one was naturally anxious, and at the beginning of the winter term I advised the Headmaster to stop all leave of absence and to keep the boys strictly in bounds. The school is self-contained and lies in a ring fence. Walks outside were allowed, but the town, 2½ miles away, and all the houses off the school estate were put out of bounds. It was not found possible to keep visitors away, and swarms of these arrived every Wednesday and Saturday throughout the term, many usually staying over the week-end, nor was it possible to stop all leave of absence. There was a further exposure to infection via non-resident masters and servants, the latter especially being possible carriers. These are supposed to report to me in the event of any illness occurring in their homes, and when possible I suspend them coming into contact with the school, but I do not think this is a very certain check. As an attempt to adjust actual conditions to the reduced diet values which have recently pertained we had previously increased the amount of sleep by one hour and decreased the amount of work and play, and these measures were continued in force. I also introduced the nasal drill as described by Dr. Isabel Ormiston in THE LANCET of August 24th, 1918. The method used is substantially as described by her, and the boys do the drill twice daily—on rising in the morning and before going to bed at night. The nose-blowing is performed six times to the word of command, which is given by the monitors, who act as pupil instructors of physical training, and form the first exercise at every P.T. drill, which at present is done in the dormitories after washing in the morning. (I am aware that this is not the most suitable time, but at present it has not been found possible to give another time for P.T., and it is not done on an empty stomach, as the boys are given two wheaten biscuits each on rising.)

Dr. E. L. Hunt, bacteriologist to St. George's Hospital, suggested to me the possibility of vaccine prophylaxis—and after talking it over with him we decided to give a single small dose of polyvalent influenza vaccine. We were averse to using a mixed vaccine, because we regard cases of pneumonia and streptococcal infections as "complications" occurring, in the majority of cases, after the onset of an influenzal infection. In some cases, it is true, pneumonia is present when one first sees the case, but that is, we think, to be expected in a certain percentage of cases. Also, as the inoculation of a large school might, if not successful, have occasioned considerable comment, I preferred what seemed to me the lesser risk of an unmixed vaccine. We decided to give a 70 million dose to all boys over 14 and 30 million to those under 14. A post-card was sent to every boy's parent or guardian informing them that their boy would be inoculated as a preventive measure unless they wrote to me that they objected.

Account of the Prophylactic Vaccination.

I inoculated the boys on Oct. 30th (approximately at half term).

306 boys received 70 million. | 327 boys received 30 million.

Total: 633 boys inoculated.

39 boys' parents objected to inoculation.
128 boys I considered unsuitable for inoculation.
19 boys were absent ill.

Total: 186 boys not inoculated.

Approximately 77 per cent. of the school were inoculated.
In addition 34 of the staff received 70 million.

The proceeding was, of course, voluntary as regards the staff and their families, but the response to the invitation was poor, as approximately 13 per cent only of the staff and families were inoculated. Every precaution was taken. Temperatures were taken morning and evening the day before, the day of, and three days following, the inoculation. All games and O.T.C. parades were stopped for the same period, and only very moderate exercise allowed until the sixth day after.

All the boys were inoculated the same day by me, with the assistance of two nurses, one charting particulars, the other preparing the skin. The injection was made with a 5 c.cm. Record syringe, holding 10 ¼ c.cm. doses, and given in the left forearm on the extensor surface just below the elbow. The first 100 were swabbed with ether, but after that, owing to the fumes, tinct. iodi was used.

The boys marched to the infirmary by houses, according to a time table previously circulated, stripped coats in my out-patient room, and then came through an inner room where the injection was given. Then returned to the first room and waited until the whole 50 boys in the house had been inoculated or rejected. In this way any bleeding, faintness, &c., was known of and seen to.

The needle used was dipped into boiling water between each puncture, and the syringe refilled every 10 punctures. The vaccine was made for me by Dr. Hunt from a series of cultures of Pfeiffer's bacillus obtained at St. George's Hospital in the year's epidemics, and was put up in bottles of 100 doses, the dose in each case being ¼ c.cm. of vaccine, the labels for the bottles containing the 70 and 30 million doses being different. In this way I was able to get through the whole 633 inoculations and see also the 167 rejected. Every boy was seen and questioned by me as to fitness before inoculation. Each house of 50 boys came up in charge of the head boy, who brought a list showing the temperature of the boys for that morning and the previous evening.

The temperatures were taken in each house by the house matrons, assisted by the masters or senior boys, and this work was supervised during the day by a nurse who was specially employed for this purpose and who afterwards charted the complete records. Possibly as a result of these precautions there were no cases of severe reaction.

The boys were all seen again three days after the inoculation (when they attended for the mid-term weighing) and were questioned by the nurse in my presence as to reaction with the following result:—

Dose in millions	Local.		Focal.		General.		Inoculated.
	Marked	Slight.	Sore throat.	Cold.	Malaise	Diarrhœa.	
70	0	4	10	1	19	0	306 } 633
30	0	6	9	4	29	1	327 }
Total...	0	10	19	5	48	1 (G. total, 83)	

In no case was a rise in temperature recorded. Of the 83 only one boy was sufficiently incommoded to report at the infirmary, and he was one who had light brawny swelling round the site of puncture, which subsided after the application of a couple of cold-water compresses. Of the 48 cases of malaise probably half can be discounted, if not more, as no one had reported, and the majority of the histories were given in response to leading questions by the nurse. If *all* are included the number of reactions equal 13 per cent.

The Immunity from Disease in the Winter Term.

There were during the term no cases of definite influenza among the boys except one—a boy who had been inoculated with a 30-million dose on Oct. 30th. He went home to attend his mother's funeral on Nov. 20th, she having died from influenza. On his return on Nov. 24th he reported to me according to the school rule, and I kept him isolated. The same evening he had a slight rise of temperature, with headache and pain in the back; the next day coryza and cough—no other signs—and the temperature became normal in three days. Probably this was mild influenza. In regard to the rest, there were during the term 36 cases of "chill," as already mentioned. These were cases of raised temperature, malaise, slight sore-throat, &c., without definite physical signs admitting of an exact diagnosis. They all recovered with a day or two in bed on a light diet.

Influenza was from September on very prevalent in Horsham and in all the surrounding villages, and from Oct. 14th onwards there were cases among the staff living in the school precincts. On Oct. 14th a maid from the Preparation School House went down with influenza, and on the 15th and 18th a second and third went down. Two of these developed pneumonia the second day of disease. A fourth maid from the same house went home on the 19th quite well and went down with influenza at home that afternoon. She afterwards developed pneumonia. On the 23rd and 26th two maids in another house developed mild influenza. All these cases were immediately isolated in the infirmary, and there was no further spread in the school. On Oct. 24th a

master's wife and on Nov. 4th a second master's wife, living at the opposite end of the avenue, developed definite influenza. They were both isolated, and no further spread occurred. About 10 other cases occurred in various houses on the estate, but not so immediately in contact with the school proper. All these cases recovered, and except the 3 pneumonias there were no complications. None of these were inoculated, and of these cases 6 only occurred after the school had been inoculated.

As already stated, the total number of medical cases treated in the school during the term was considerably lower than the number for any other term, winter or summer, since 1898, before which date the records have not been tabulated. The majority of these were definite cases of bronchitis, pleurisy, gastritis, &c., but 36 were perforce classified as "chill." It may be argued that these were cases of modified influenza. Unfortunately, bacteriological examination was not practicable.

Against the diagnosis of influenza are the absence of definite symptoms, the short duration of illness in the majority of cases (the average time in hospital of the 36 is just under three days), and the complete absence of after-effects. In favour of the diagnosis is the known contact with many potential carriers and close proximity to several definite cases. Twelve of the 36 occurred before Oct. 30th, and 24 occurred after Oct 30th. Of the 24 occurring after Oct. 30th, 7 were among the uninoculated = 4·2 per cent., and 17 were among the inoculated = 2·6 per cent. (2 with 70, 15 with 30 million).

The view has been put forward that the administration of any vaccine produces an increase of resistance to any organisms in the individual. 77·2 per cent. of the school were inoculated on Oct. 30th. Sixty-four medical cases of all kinds were admitted to the infirmary after that date; of these, 41 had been inoculated = 6 per cent.; 23 were uninoculated = 13 per cent.

The statement was made in the Press that I had instituted a routine nasal douche of potassium permanganate. This is incorrect. It would have been impossible to arrange to douche 800 noses by trained help, and I should regard such a proceeding, if left to the unaided resources of the boys, as a most unsafe method. I think the fact that inoculation was performed acted as a great mental factor. It is possible that the cases labelled chills were in fact cases of modified influenza, though, in my opinion, the clinical evidence is against this.

The chief factors in what is an extraordinary immunity appear to be—(*a*) the physical training, which though it has been seriously undertaken for six months only, has already produced a marked improvement in physique. (*b*) The nasal drill, which perhaps is the most important of all. (*c*) The fact that for the past three months the caloric value of the school diet has reached practically the pre-war value of 3000 calories per boy per diem—for the first time since 1916. (*d*) The effect of inoculation, therapeutic and moral.

It will be interesting to know when the school reassembles how many boys have contracted influenza, or have been definitely exposed to it during the holidays.

Note by Dr. E. L. HUNT.

The following note as to particulars of the preparation of the vaccine has been kindly added by Dr. Hunt.

The vaccine used was a polyvalent one, containing only the influenza bacillus, obtained from different sources.

The organisms used were as follows:—

(*a*)	*Bac. influenzæ*	obtained from nose,	October, 1918.
(*b*)	,,	,, sputum,	June, ,,
(*c*)	,,	,, nose,	October, ,,
(*d*)	,,	,, sputum,	July, ,,
(*e*)	,,	,, ,,	September, 1918.

These organisms from when first isolated had been kept going on blood-agar medium at 37° C.

The medium used for the vaccine tubes was rabbit's blood agar, made by adding some 5 drops of the blood, freshly obtained under aseptic conditions, to 4 c.cm. of melted lemco-peptone-salt-agar at about 60° C., the tubes being mixed, slanted, and allowed to cool.

Ten tubes were inoculated (Oct. 26th, 1918) from each of the 5 organisms, respectively (50 tubes) and grown for 48 hours at 37° C.

The vaccine was heated in a water-bath at 55° C. for 30 minutes. Sufficient vaccine was thus obtained to yield—

5 × 50 c.cm. bottles, ½ c.cm. = 70 million.
5 × 50 c.cm. ,, ½ c.cm. = 30 ,,

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON A CASE OF PERICARDIOTOMY.

BY T. P. NOBLE, M.D. EDIN.,
CAPTAIN, R.A.M.C.;
AND
A. B. VINE, M.R.C.S., L.R.C.P. LOND.,
CAPTAIN, R.A.M.C.

IN the following case pericardiotomy was performed on the twelfth day after passage of a rifle bullet through the chest, with recovery of the patient.

The patient, a lieutenant in the Lancashire Fusiliers, was wounded on April 11th, 1918, by a rifle bullet which entered in the third interspace ½ in. internal to the nipple line on the left side, and had its exit 1½ in. to the left of the mid-line behind, on a level with the seventh dorsal spine. His first sensation when he was hit was a burning pain behind; then he fell, and all power seemed to leave him. A few minutes later he was able to run 50 yards with the aid of a man supporting him on either side. He did not lose consciousness, but had considerable dyspnœa. Admitted to No.—C.C.S. (April 11th). The notes on his field medical card show the following: "Entrance and exit wound left chest, swelling in the left pectoral region, and signs of a small hæmothorax."

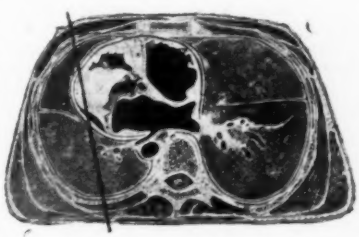
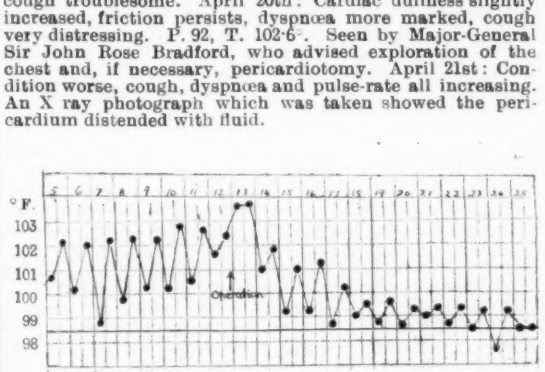


Plate from Johnson Symington's "Atlas of Topographical Anatomy," indicating the probable path of the bullet, which appears to have punctured the pericardium and grooved the muscular wall of the heart.

Admitted to No.—Stationary Hospital on April 14th. Considerable difficulty in breathing, and had to sit almost upright. P. 90, R. 30, T. 100·6° F. E. and E. wound as noted. (See Figure.) The entrance wound was merely a puncture with a rather larger exit one. Cardiac dullness: Right side, 1 in. to right of sternum; left side, to the nipple line and upwards to the lower edge of the second rib. Pericardial friction heard to the right of the sternum and near the apex. Posteriorly there was dullness up to the level of the exit wound, breath sounds heard all over, but weak. April 16th: T. varies from 100° to 102°. Friction more marked and audible all over the præcordia. Dyspnœa continues and cough troublesome. April 20th: Cardiac dullness slightly increased, friction persists, dyspnœa more marked, cough very distressing. P. 92, T. 102·6°. Seen by Major-General Sir John Rose Bradford, who advised exploration of the chest and, if necessary, pericardiotomy. April 21st: Condition worse, cough, dyspnœa and pulse-rate all increasing. An X ray photograph which was taken showed the pericardium distended with fluid.



Operation.—General anæsthesia with chloroform and ether, with preliminary morphia and atropine hypodermically. Twelve ounces of clear fluid were withdrawn from the left pleural sac, which was proved to be sterile. An incision was now made along the fifth rib and cartilage from the mid-line to the nipple-line, the fifth costal cartilage was resected, the fibres of the triangularis sterni muscle were separated, and the internal mammary artery drawn inwards. The

pericardium was now picked up and a vertical incision was made in it. Very little fluid at first escaped, but when the finger was insinuated between the right auricle and the pericardium and between the left ventricle and the pericardium cloudy fluid escaped in quantity, which on bacteriological examination was found to contain a short streptococcus. Glove drains were inserted to the right and left inside the pericardium and the wound was closed.

April 23rd: Breathing and cough much easier; drains removed. Pulse and temperature now gradually fell and the wound healed by first intention. Four weeks later he was evacuated to England. The cough and dyspnœa had disappeared, the cardiac dullness was much less, and there was no friction.

Subsequent inquiry two months later showed that his improvement was maintained.

THE MOLYBDENO-TUNGSTEN ARC IN THE TREATMENT OF VARIOUS SUPPURATIVE LESIONS.

(As used at a Divisional Rest Station and a Stationary Hospital, Italian E.F.)

BY B. MICHELL YOUNG, M.R.C.S., L.R.C.P., D.P.H.,
CAPTAIN, R.A.M.C. (T.)

THE very numerous cases of old wounds, ulcers of various parts of the body, carbuncles, inflammations of the cutaneous tissues, and such like, have presented many difficulties to obtain rapid healing. Many methods have been employed with more or less success to lessen the period during which the man is incapacitated from duty. In March, 1917, I first used the molybdeno-tungsten arc on skin lesions, and suggested that it should be employed for the treatment of this class of case. The lamp was erected first at the divisional rest station, the necessary current being obtained from a repair-motor lorry's engine situated some 400 yards away. This was satisfactory. Afterwards it was connected to the town-supply at the stationary hospital.

The cases selected for treatment were chiefly those which were of considerable duration and which showed little or no improvement obtained by previous methods of treatment. The exposure given was generally three minutes at a distance of 50 cm. from the arc. The dressings used were practically in all cases of gauze damped with sterile water; in a few normal saline was used. This was adopted as it was desirable to eliminate any cause of improvement, or the reverse, other than the effects of the ultra-violet rays produced by this arc. I am basing my remarks on my own experiences and on a series of cases treated by Lieutenant-Colonel Wells, to whom I am indebted for kindly forwarding to me his notes and observations. In considering the various effects and non-effects produced, the cases tend to group themselves into acute lesions, stationary or inactive lesions, and chronic. In the acute lesions, frost-bite, carbuncles, large areas of inflamed and ulcerated skin responded readily. A series of frost-bites especially, with loss of tissue, afforded effective comparison, as only one limb was exposed to the light, while the other was treated with the usual methods. In every case the light caused prompt healing in about eight days, while the other remained unhealed. In 38 cases of generalised sores many were healed more speedily by this method of treatment.

Ulcers of heels and toes require relatively more exposures according to the length of time they have acquired their indolent condition. But once the effect is produced they steadily progress in the process of repair. Occasionally a case is met which refuses to respond. For this I can advance no reason; one such occurred in this series—possibly specific.

Taking the whole series, the exposure of three minutes is sufficient in the first group and good results were obtained, but this should be increased even to causing erythema of the surrounding tissues, until evidence of activity in the sores is produced in those obstinate cases, and possibly more rapidity of healing would be obtained. Cases of bubo which had been incised were treated from the outset with daily exposures of three minutes, and each healed in eight days, leaving a narrow healthy linear scar, comparing favourably with cases treated in the usual way; and my experience shows that, speaking generally, there is an absence of thickening and puckering in cases so treated.

Some patients develop an erythema in the surrounding skin (especially those of the fair type) in response to the light, but increase of distance or interposition of the quartz globe neutralises this effect. The skin soon becomes tolerant, when full exposures may be given.

The lamp now employed is known as the "meridian" automatic feed arc fitted with the new molybdeno-tungsten electrodes. It is connected in the usual manner with the ordinary house supply, and is a suitable contrivance for all voltages above 100 volts, both direct and alternating current. The observations which these cases afford lead one to the opinion that this method of treatment is useful for shortening the incapacity for duty.

A PLASTIC VOCAL CORD.

BY FERRIS N. SMITH, B.A., M.D. MICHIGAN,
HON. CAPTAIN, R.A.M.C.

THE following case is reported because of the unusual possibilities which it suggests at this time, when many cases of traumatic aphonia are added to the usual list of such cases resulting from disease. The technique was quite original; no similar procedure has been found or suggested in the literature. The patient is the secretary-manager of a large home for aged Dutch people, and was in excellent health when last heard from in June, 1918.

J. C. H., aged 62, came for examination in January, 1917, on account of rapid loss of voice, some referred pain radiating to the right ear, and slight loss of weight. He gave a history of removal of a small mass from the right vocal cord and cauterisation three years previously. Inspection revealed a nodular, rough mass about the size of a split pea at the mid-portion of the free margin of the right true cord; this prevented apposition of the cords, causing the loss of voice. A small specimen for examination was removed through the laryngoscope. The pathologist reported "squamous-celled carcinoma."

In view of the previous history and findings a radical operation—hemilaryngectomy—was indicated, but on account of the man's occupation, which necessitated the retention of some speaking voice, I was loath to follow this procedure. The posterior end of the cord with its arytenoid attachment was apparently free from infiltration, and offered a foundation for the procedure which was carried out. There was a great deal to gain and very little to lose in the effort to reconstruct this vocal cord before resorting to the radical procedure. Further, any healthy mass of tissue which could be put in the cadaveric position of a vocal cord would furnish an abutment for the functioning cord and ensure spoken voice. The functioning arytenoid offered hope of some motion.

With the above considerations the following operation was conceived and executed in two stages at the Blodgett Memorial Hospital, Grand Rapids, Michigan, in February, 1917:—

Stage 1 consisted in the dissection and packing of neck structure about the larynx to produce an inflammatory barrier against infection of the deep planes of the neck after opening the airway and preparing the distal end of a flap to imitate the form of a vocal cord. This was done by making two short incisions to outline the lateral borders, dissecting the skin free from underlying tissues, planting a small piece of cartilage, and suturing a tuck or fold in the skin to include this cartilage. The crest of this fold was three-eighths of an inch above the normal skin level. The balance of the flap was not dissected until the second stage of the operation.

At the second stage a laryngotomy was performed, and the anterior three-fourths of the cord, with all soft parts in a wide area extending down to the thyroid cartilage, was removed. The skin flap, with a broad base in the supra-scapular region of the right neck and its prepared distal end just above the right nipple, was dissected. The distal end was trimmed to fit in the denuded area of the larynx in such a manner that the fold containing cartilage assumed the level of the former cord. It was sutured to the cord stump on the arytenoid and border soft parts with horse-hair. A tracheotomy-tube was inserted through the upper two tracheal rings and the larynx packed with bismuth paste gauze. The larynx was held slightly open with a Jansen mastoid retractor. The skin opening of the neck and chest was closed by undermining and sliding the skin.

The patient was placed in a bed which was considerably elevated at the foot. He was fed with a gastric tube. The skin flap was covered with warm, constantly changed, boric compresses, and the larynx was dressed twice daily.

On the eighth day the mid-portion of the pedicle of the flap showed signs of withering. This was resected on the ninth day, part of the base being returned to the neck. A small part of the inferior border of the larynx implant

sloughed, but this was not in a position to vitiate the result. The tracheal tube was withdrawn at this time and the larynx and neck closed, excepting the tube tract, which was lightly packed. Subsequent recovery, except for a mild bronchitis, was uneventful.

The patient had a hoarse, whispering voice immediately upon closure of the larynx. The voice quality constantly improved with the disappearance of the local reaction until it was functionally excellent, only a slight huskiness remaining.

Several improvements in technique have occurred to me since seeing the plastic work of Major H. D. Gillies at Queen's Hospital, Frognal, Sidcup. His method of tubing a long pedicle by suturing its raw edges would undoubtedly prevent the gangrene which occurred in my flap, and leave a clean, healed neck to deal with at the time of the major procedure. The distal end of the flap should be completely outlined by skin incision and resutured in place to increase its blood-supply, and the cord accurately reproduced, even to a thin edge, by shaping a piece of costal cartilage instead of using the thin septal cartilage. This should be done in the first stage.

The method is applicable to cases of hemilaryngectomy, either surgical or traumatic, if three stages are employed, the second stage to consist in removal of the diseased or scarred portion of the larynx and lining the deficiency with skin, leaving for the third stage a shaped cartilage implant to give stability to the larynx box and an abutment for the functioning cord.

Medical Societies.

ROYAL INSTITUTE OF PUBLIC HEALTH.

Discussion on the Prevention and Arrest of Venereal Disease in the Army.

A SPECIAL conference was held on Jan. 8th.

Lord SYDENHAM, chairman of the National Council for Combating Venereal Diseases, who presided, said that medical science in all its branches had been powerfully stimulated by the war, and victory had been gained over many of those diseases which used to cripple armies in the past. We understood now better than ever before that medical science and sound administration must always go hand-in-hand, and together could produce an immense improvement in public health. Public health and the happiness of the people went together. In so far as venereal disease could be arrested in the army it must be an immense gain and protection to the civilian population. During the war there had been an increase of infection among that population which would increase the risks to demobilised men.

The Policy of Silence.

Professor J. G. ADAMI, Colonel, C.A.M.C., read a paper opening a discussion on the Prevention and Arrest of Venereal Disease in the Army. He said that the performance of a physiological function which the individual in his heart of hearts knew to be in itself natural and desirable had to be regarded and taught as contrary to good morals. We found ourselves torn asunder between Peter and Paul; the Peter that is within us teaching us that what God has given us is clean and is to be enjoyed; the Paul, that woman is a snare and that even a bishop should have but one wife—and scarcely that. And as youth was largely irresponsible and the sense of social duty a plant of slow growth, which in some throughout life was choked by the weeds of personal predilection, it had followed that the whole matter of sexual conduct had for generations been surrounded with an atmosphere of insincerity, not to say hypocrisy. The "dead hand" of training began in early childhood, whereby we were taught to regard the open discussion of sexual matters as taboo; and there was the "dead hand" of schoolboy "form," according to which public acknowledgment of one's standing in relationship to moral matters, save on the part of those who had donned the cloth and become professional moralists, branded one as either a prig or a humbug. Happily, we were passing out of this phase.

What this policy of silence had cost the country and the Army during the last four years was awful to contemplate. Before the war the annual reports of the Director-General had warned the Government as to the prevalence of venereal disease in the Army; a quarter of all admissions to hospital were due to this cause, but, with the war, no steps had been taken to render the regulations against harlotry more rigid. Our men had been in the venereal hospitals not by companies but by battalions. Each case had meant two months and more on the sick list, and weeks and months before the individual could be restored to full vigour at the front, if, indeed, there was not left a legacy of rheumatism, eye disease, and enfeebled general health.

The Position during the War.

When in the autumn of 1914 the first Canadian contingent arrived upon Salisbury Plain it was found that the Common Law of England and the Military Law were equally impotent to cope with the condition of affairs revealed. Harlotry in England seemed to be a protected but not a controlled profession. This, however, was also largely true of Canada, but the Canadian authorities did expect that in England in war time they would get willing help from local and London authorities in protecting the soldier. Of help there was little. Each week-end there poured into Salisbury Plain from London from 80 to 100 loose women, and it was not until under the Defence of the Realm Act in 1916 that the naval and military authorities in one area, where there had been a large outbreak of venereal disease, were empowered to transport out of that area those directly or indirectly concerned in the profession of prostitution.

He was convinced that the policy of frank dealing and open speaking on the subject was the only one that would improve conditions. Even at this late hour he begged the National Council for Combating Venereal Disease to influence the Government to publish a statement regarding the venereal situation in the Army in successive years of the war, in the different regions—at home, France, Mesopotamia, and the like—so that the country might know the extent of the trouble as it affected the Army, and, simultaneously, to obtain powers to make an investigation in selected areas or classes of the population into the frequency of either syphilis or venereal diseases in general in those areas or classes. Let the situation be known and faced. Had the medical profession, the National Council, and the Government spoken out at the beginning of the war the well-being and happiness of the country and the conditions of our troops would to-day have been very different from what it is. In 1912, before the war, the Surgeon-General at Washington had published outspoken regulations directing all soldiers returning to camp to state whether they had exposed themselves to the possibility of venereal infection and detailing the early preventive treatment to be given to those who had been exposed. This he (Colonel Adami) had reported upon to the War Office, but the "dead hand" had prevented its adoption for close on two years.

Preventive Measures and their Results.

With regard to the methods in vogue in the overseas military forces of Canada it had been found in practice that there was no one procedure which was effective in arresting venereal disease in the army; it was necessary to employ a combination. The Director-General had put into force all the methods save one (court martial)—education, warning, recreation, diversion, protection, isolation, prophylaxis, and penalties.

With regard to early treatment every Canadian orderly medical room in England was an early treatment centre, open day and night, with trained N.C.O.'s to supervise and see that the soldier carried out fully the instructions given. For those on leave in London there were open day and night two early treatment centres, at Southampton-street and at Victoria, and another treatment was given on their return to their units. The Dominions worked together, and if no Canadian centre was open the men could go to an Australian or New Zealand centre. The Canadian authorities in their talks to the men on parade made a point of emphasising that neither prophylactic nor early treatment assured absolute immunity to venereal infection. Experience had shown that even under expert supervision no procedure was free from occasional failure. The Canadian authorities firmly believed that if the Army and the populace in general were advised that absolute deterrents existed when this was not the case, there

was a possible danger of their employment leading, not to diminution, but positive increase in the spread of venereal disease. This had actually happened in Germany.

One set of statistics alone, he thought, would eloquently show the effects of the campaign undertaken by the Director-General through Lieutenant-Colonel Amyot and his staff. During the month of September, 1916, from nearly 42,000 Canadian troops in Great Britain there were admitted to hospital suffering from venereal diseases 960 cases, practically a battalion. During the month of September, 1918, from among 110,000 Canadians in Great Britain there were 750 similar admissions. In two years the venereal incidence had been reduced more than 66 per cent.; it stood now at less than a third of what it did two years ago. Had they continued at the same rate the admissions during the month of September, 1918, would have been, not 750, but over 2500—that is, two battalions and a half out of action.

The Dangers Ahead.

Throughout the war the soldier had been well cared for with regard to venereal disease, but it was the civil population that to-day constituted the grave danger, and nothing had been done to meet the emergency. When our soldiers returned and were feasted, made drunk, solicited, and fell, there would be no medical orderly-room to go to after demobilisation, no provision for early treatment, no N.C.O. to see that the elaborate toilet was duly performed. The soldier would receive and not give, and, admitting that the provision of prophylactic treatment to an uninstructed public might well result in the spread rather than in the production of the disease, he was strongly of opinion that the soldier before demobilisation should be provided with the means of prophylactic treatment, should be advised where and how to obtain "tubes" without difficulty, and, moreover, be given precise detailed instructions as to the method of employment. For the good of the country he saw no other possible course. To those who, in the supposed interests of morality, would still maintain the policy of silence he could only repeat what he had said in Westminster in July to the National Conference upon Maternal and Infant Welfare: "Which is the more immoral act, to advise a man how to prevent infection if he has transgressed the moral code, or calmly and coldly to look on without moving a finger while, through ignorance on his part, the innocent wife and children are diseased, and they and the community suffer through generations?" Unless something were done and that immediately the next few months would see a spread of venereal disease in this country that for generations would cause the Empire to suffer. Now, if ever, it was well to repeat His Majesty's famous exhortation, "Wake up, England."

Discussion.

In the discussion which followed Professor HUGH H. YOUNG, Colonel, U.S.M.C., strongly advocated the use of prophylactic treatment which had been enforced in the United States Army in 1912. In the following five years venereal disease was reduced nearly 50 per cent. During the war as far as possible large centres like Liverpool and London were avoided in sending troops through England, and in France brothels were placed out of bounds with very gratifying results. Some of the brothels in that country were terrible places, accommodating as many as 1000 or 1500 men in the course of an afternoon or evening. Even granting that the women there appeared to be healthy on medical examination, when men followed each other in such rapid succession the women became carriers of the disease. In one case a boy doorkeeper who had frequent connexion with these women was found to be actively syphilitic. The women acted as temporary hosts for the disease and sources of danger regardless of the most careful medical examination. This was a point which he thought was new. The situation in London and other big cities was a disgrace, and it was a crime that the police should not be able to arrest the women whom they knew to be prostitutes. The soldiers would come back to a civil population presenting far more dangers than the soldiers themselves. Prostitutes were greater criminals than thieves, for what was the loss of a little money compared with the health of the country's manhood? The calomel packet with a leaflet giving full instructions for use on one side and moral instruction on the other, if thought necessary, should be on sale in slot machines at 1*d.* throughout the country.

Professor WILLIAM F. SNOW, Lieutenant-Colonel, U.S.M.C., who is in charge of the Repression of Venereal Diseases Department of the Surgeon-General's Office, United States, said, starting on the basis that continence was the best remedy, the American Government had provided all kinds of entertainment as a counter-attraction for sexual excitement. The public were notified as to what was being done and told that the Army would be affected by the way the public authorities looked after its manhood. The public had never opposed any of the Army's proposals. There was no conflict between morals and public health. He did not fully agree with Colonel Young as to the use of slot machines, because the packet gave the man the opportunity of making his own diagnosis and treating himself, which might not be done properly. If all dispensaries opened their doors to the man who said "I have just exposed myself" he did not see any moral danger in it.

Major-General Sir FRANCIS LLOYD, who had commanded the London district for the past five years, said the question ought to be dealt with from every point of view.

Sir JAMES W. BARRETT, Lieutenant-Colonel, R.A.M.C., late Australian A.M.C., in giving his experiences with Australian troops, said that moral forces had been brought to bear, but it was only after the use of prophylactic methods that any general good had resulted. In regard to the general question, the root cause of the whole trouble was the marriage age. While that age remained on an average 30 for men and 27 for women, there was nothing that would prevent the sexual relationship of many people.

Surgeon Captain P. W. BASSETT-SMITH, R.N., detailed the voluntary prophylactic methods in use in the Navy.

Sir ARTHUR NEWSHOLME considered that the Canadian and American methods of meeting the venereal peril were the most complete that had yet been devised, but he was imbued with a sense of despondency at the relative ill-success of the results. If under military discipline the results were disappointing, what prospect of very rapid or immediate success was there under the free conditions of civilian life? When a public health measure came in conflict with morals the first would suffer, and if a public health measure were to be carried and applied with success moral sentiment must go with it.

Professor J. A. AMYOT, Lieutenant-Colonel, C.A.M.C., said that the men were given every possible means of treatment, and the results had been satisfactory.

Dr. HELEN CHAMBERS was of opinion that the reason for the ineffective way of dealing with the matter in the past was the fact that the woman's point of view had been ignored. The time had come when women should receive instruction from the medical women of the country. The scandalous state of the streets should be dealt with by women police. She pleaded for institutions where patients suffering from venereal disease could be sent as infectious patients and retained till cured, and where the nature of the disease would not be made public.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Exhibition of Cases and Specimens.—Abderhalden's Pregnancy Reaction.

A MEETING of this section was held on Nov. 22nd, 1918, Sir J. W. MOORE, the President of the Academy, being in the chair.

Dr. R. D. PUREFOY showed a specimen of Tubal Pregnancy, which was discussed by Sir WILLIAM SMYLY and Dr. BETHEL SOLOMONS.

Dr. SOLOMONS showed a specimen of Sarcoma of the Cervix which he had removed from a woman aged 50. She had been married 26 years and had 11 children, the youngest of whom was 11. She complained of a feeling of "womb falling" after the birth of her last child, but the symptoms vanished until 14 days before she consulted him. On examination it was found that a large mass, about the size of a large grape fruit, filled the vagina and was connected with the posterior lip of the cervix, with which it was incorporated. The tumour was removed, and as the cervix was hypertrophied it was amputated. A pathological examination by Dr. J. T. Wigham revealed the growth to be a spindle-celled sarcoma, with a large amount of hyaline degeneration of the capillaries, forming a kind of cylindroma. Following

this report, Dr. Solomons performed Wertheim's hysterectomy, and convalescence was without incident. The uterus on examination proved to be normal. He commented on the silent growth of the tumour, with absence of symptoms, which was typical of these rare cases of primary sarcoma. He thought that a radical hysterectomy should always be done in this class of case.

Dr. J. T. WIGHAM thought that the sarcoma, although malignant, was, if one might call it so, a benign form of sarcoma.

Dr. PUREFOY said that sarcoma limited to the cervix uteri was rare. In very young subjects myxosarcoma was sometimes seen springing from the cervix in the form of numerous small cysts, but its removal was generally followed by recurrence. Notwithstanding the pathologist's opinion, he was inclined to regard Dr. Solomons's case as one of uterine fibroid showing sarcomatous degeneration.

Sir WILLIAM SMYLY showed Two Tumours of the Mesentery removed from a patient in the Adelaide Hospital. The patient had a large cystocele which protruded through the vulva and caused much difficulty in emptying the bladder. On examination a tumour was discovered in Douglas's pouch which was supposed to be ovarian. After performing an anterior colporrhaphy the abdomen was opened and the tumour, which was exceedingly friable, was drawn out and found to be intimately connected with the intestine. A second tumour was discovered higher up in the mesentery. The tumours, which were thought to be malignant, were removed, together with about two feet of the ileum and a large piece of mesentery, and the severed gut restored by a side-to-side anastomosis. The patient made an uneventful recovery.

Captain J. SPEARES, who examined the specimen, said that the edges of the tumour were tubercular, but the central portion was so necrotic that it was impossible to diagnose the condition.

Dr. W. M. CROFTON read a paper on Abderhalden's Pregnancy Reaction and Beard's Theory of the Alternation of Generations in Vertebrates. After describing the nature of tissue digestion of normal foodstuffs and abnormal substances given parenterally, he showed that the substrate—viz., the placenta—with the possible exception of the syncytial layer, could not possibly be considered foreign or disharmonious, and that, therefore, no specific ferment would be found for it in the maternal system. On the other hand, if Beard's theory was correct, the cells of the chorionic villi, &c., belonging to the phorozoon or asexual generation were foreign or disharmonious, and therefore a specific ferment would be formed to their protein which could be recognised by a complement fixation test. He criticised Abderhalden's method of detecting the presence of his protective ferments.

LECTURES ON INFANT CARE.—On Mondays, from Jan. 27th to April 14th, at 5.30 to 6 30 P.M., a course of 12 advanced lectures on infant care, for nurses, health visitors, teachers, infant-welfare workers, and others, will be held at 1, Wimpole-street, London, W., under the auspices of the National Association for the Prevention of Infant Mortality. The course is in preparation for the advanced certificate of the Association. The fee for the course is 5*s.* and for a single lecture 1*s.* On Thursdays, at 7 to 8 P.M., from Jan. 23rd to April 10th, a similar course of elementary lectures, in preparation for the creche nurses' certificate, arranged by the Association, together with the National Society of Day Nurseries, will be held at the Midwives' Institute, 12, Buckingham-street, Strand, London, W.C. To secure this certificate students must take 12 months' training and gain a certificate for proficiency at an approved day nursery, attending two courses of 12 lectures, of which this is the first. The fees are 10*s.* for the course or 1*s.* for a single lecture. Tickets from Miss Halford, secretary, National Association for the Prevention of Infant Mortality, 4, Tavistock-square, London, W.C.1, or from Miss Maddock, secretary of the National Society of Day Nurseries, 13, Victoria-street, London, S.W.1. A further special course of 12 lectures on infant care for health visitors, midwives, school teachers, voluntary health workers, and committees of nursing associations, will be held at the University Museum, Oxford. Some local authorities now have the power under the Maternity and Child Welfare Act of August, 1918, to defray the expenses of their workers in attending lectures such as these.

Reviews and Notices of Books.

War Story of the Canadian Army Medical Corps. Vol. I. By J. GEORGE ADAMI, M.D., F.R.S., Temporary Colonel, C.A.M.C. Published for the Canadian War Records Office by Colour, Ltd., and the Rolls House Publishing Co., Ltd. 1918. Pp. 286.

Sir Robert Borden, in opening an admirable collection of Canadian war pictures at the Royal Academy, London, on Jan. 4th, spoke of the inspiration he found in witnessing the triumph of spirit in Canadian hospitals over dull pain and monotony of long weary months, and that the inspiration was not lacking on the side of those who devoted their services to the care of sick and wounded is abundantly evident from the pictures themselves as well as in the story of the work of the Canadian Army Medical Corps told by Colonel Adami in a book to which Sir Robert Borden contributes an introduction. The record is intended, first of all, for the actual men of the corps, to whom, and to whose children's children, the wealth of personal detail will be of surpassing interest. But to the non-Canadian reader the story has the freshness of an adventure. The first volume, which is in our hands, deals with the medical service of the first contingent of Canadian troops up to the autumn of the year 1915 Canada being in the happy position of having seen little active warfare since 1812, the C.A.M.C. had to work out its arrangements largely as it went along. The Riel rebellion in 1885 necessitated the appointment of medical officers to the field force, and it was in this little campaign that a surgeon-general was first appointed at Ottawa. The wounded were few and sickness was slight in a campaign on conspicuously healthy terrain. It was as recently as 1896 that a definite medical subdepartment was created to the militia, when the late Sir Frederick Borden, himself a medical man, became Minister of Militia.

The story of the organisation of the corps during the following 20 years is of more than ephemeral interest. Appreciation of the value placed upon research is one of the strong traditions of the corps, with the result that research was carried on in the field, and No. 5 Canadian Mobile Laboratory has formed the background of a number of articles of permanent value which we have published in our own columns dealing with such practical matters as chlorination of water, mosquito prevention, and sundry aspects of trench fever. The use of poison gas as a weapon of offence was a terrible experience in which the C.A.M.C. was the first to participate. The diary of Thursday, April 22nd, 1915, cannot now be read without breathless interest, and the enterprise of Lieutenant-Colonel Nasmith in reporting almost at once on the nature of the attack and the means desirable for facing it may count as one of the achievements of the corps. Alongside the Turcos staggering back through the lines, dazed and weaponless, ran numbers of Belgian hares escaping from the gas and already so affected by it as to be knocked over without effort by the canteen cooks. Incidentally, poison gas had one thing to recommend it: Colonel Adami records that it materially reduced the live stock in the dug-outs and had an excellent potency in destroying the parasites of "that most irritating and most humiliating skin disease"—namely, scabies.

The C.A.M.C. is happy in its biographer, and the concluding volume or volumes will be awaited with keen anticipation.

The Organs of Internal Secretion, their Diseases and Therapeutic Application: A Book for General Practitioners. By IVO GEIKIE COBB, M.D., M.R.C.S. Second edition. London: Baillière, Tindall, and Cox. 1918. Pp. 274. 7*s.* 6*d.*

WHEN the physiology of the internal secretory organs has been so far elucidated, and the effect upon them of disease and their therapeutic application have been so fully studied of late years, some such work as this was needed in order to give the busy practitioner a simple lucid account of the rôle of the ductless glands, together with a practical guide to this means of treatment. The first edition was published in 1916. The second edition has been revised and brought up to date, and a chapter dealing with the relation of the internal secretions to functional nervous disease has been added, and will be found a useful addition at the present time.

Clinical Case-taking. By ROBERT D. KEITH, M.A., M.D. Aberd. London: H. K. Lewis and Co., Ltd. 1918. Pp. 104. 3*s.* 6*d.* net.

THIS is an excellent little book for the junior hospital student, being simple, clear, and concise. It was originally written for the students of the King Edward VII. Medical School, Singapore, so that the question of common tropical diseases is more than usually prominent. The introductory chapter gives a useful résumé of the scheme of case-taking, which is described and expanded in the following chapters, and the student cannot do better than have it at hand when examining a patient, and follow it out in every detail. Perhaps here at home, where, generally speaking, there is no language difficulty and time is available in which to deal fully with each case, we should be inclined to bestow more care and trouble in investigating the previous and family history than is here suggested, but that is a minor defect in an otherwise valuable little manual.

Differential Diagnosis. Vol. II. Presented Through an Analysis of 317 Cases. By RICHARD C. CABOT, M.D. Second edition, revised and illustrated. London and Philadelphia: W. B. Saunders Company. 1918. Pp. 709. 25*s.*

THE essence of the manner in which the subject of differential diagnosis is treated in these volumes is contained in the subsidiary title. The method is new and very instructive. This volume treats of the differential diagnosis of 19 prominent symptoms, and includes chapters on abdominal and other tumours, vertigo, diarrhœa, dyspepsia, hæmoptysis, hoarseness, pallor, &c. The cause of each symptom is first given and the relative frequency of its occurrence in various diseases is shown in tabular form, after which the cases are described and discussed and the outcome recorded, whether recovery or otherwise, or the findings either at operation or post mortem. The reading of such a book as this is the next best thing to a course of post-graduate clinical study.

Materia Medica and Therapeutics: An Introduction to the Rational Treatment of Disease. By J. MITCHELL BRUCE, M.A., LL.D. (Hon.) Aberd., F.R.C.P.; and WALTER J. DILLING, M.B., Ch.B. Aberd. Eleventh edition, revised to correspond with the War Amendments of July, 1917, and March, 1918. London: Cassell and Co., Ltd. 1918. Pp. 675. 9*s.*

THIS edition was being prepared when the changes were being made in the British Pharmacopœia consequent on the scarcity and increasing cost of many of the drugs in general use. The original formulæ appear as before, but the reader is referred in each case to a War Emergency Formulary at the end of the book, where the temporary substitutes are described. Many new remedies are noted, and such measures as electrical treatment, massage, and exercises are described more fully than before.

Aids to Medical Diagnosis. By ARTHUR WHITING, M.D. Second edition. London: Baillière, Tindall, and Cox. 1918. Pp. 167. 3*s.*

"AIDS" of any kind are to be deprecated unless used in the manner for which they were intended. Students of the less ambitious sort are tempted to rely on manuals of this size in the wrong way, and to regard them as "cram" books instead of setting themselves to the study of medicine in its fuller and larger aspects. Nevertheless, such a book is useful, provided it be looked at from the proper standpoint. These little "Aids" are of such a size that they can be carried about in the pocket, and are valuable for reference during, for instance, the examination of a patient. There are a few slips which should be corrected in a subsequent edition. On p. 45 it is stated that the characteristic feature of diseases of the blood is pallor; this is, of course, not so in all blood diseases. With regard to "scurvy-rickets," it was shown by Cheadle in 1878 that this name was a misnomer. The disease is usually known either as "Barlow's disease" or "infantile scurvy," the rachitic features being by no means always present and being entirely distinct, etiologically, from scurvy. Sporadic cretinism would benefit by a fuller description than that given. Perhaps the meagreness of the description is due to the fact that infantilism is not dealt with in any form, and this, we think, is a disappointing omission, as many forms of infantilism are by no means uncommon, and the main diagnostic features would take up little space. Dry pleurisy should surely not be included under "Diseases with Dullness on Percussion," a dull percussion note being said to be one of the diagnostic signs. Books of this kind have their uses, but students should be warned against placing too much dependence on them to the neglect of fuller reading.

JOURNALS.

Reconstruction. A Monthly Bulletin published by the Department of Soldiers Civil Re-establishment, Canada. October, 1918.—An Order in Council has been passed to protect discharged soldiers with amputations from the competitive attention of representatives of private manufacturers of artificial limbs. Sir James Lougheed, the Minister responsible, points out that no man with an amputation can ever feel he is bodily complete, however long he has been wearing the most perfect artificial limb possible. Although no trouble or expense has been spared by the Government to provide the best limb available, a number of manufacturers and vendors of artificial limbs have endeavoured to convince returned soldiers that the Government issues are clumsy and of little value. All artificial limbs and appliances manufactured by the Government are stamped; the Order in Council enacts that no person to whom an artificial limb or appliance is issued shall transfer, exchange, or otherwise relinquish such limb except with the written consent of the Minister, nor must such limbs or appliances be altered without similar consent. Any person disparaging goods manufactured or issued by the Department is liable to a fine. A blinded officer who after training at St. Dunstan's has been carrying on his former profession, that of electrical engineer, has been appointed to the vocational staff to represent the Government in dealing with blinded soldiers. These men will be persuaded, if possible, to accept the Government offer of training at St. Dunstan's before leaving England. 1347 men have already graduated from industrial re-education courses; 1877 are at present under instruction. Since the work began only 339 men have refused to take up a course; 558 have discontinued for various reasons. This number, however, includes 111 men whose course has been suspended for a short time to enable them to take part in agricultural production.

The Military Surgeon.—In the issue of this journal for October, 1918, Colonel Victor C. Vaughan and Captain G. Palmer complete their account of the infectious respiratory diseases in the U.S. Army last winter. These diseases were specially frequent among men from country districts and particularly from the Southern States. This is in great measure due to want of acquired immunity, but even more to want of education in sanitation, and the correlated personal carelessness. In the camps most attacked were men who had grown up in bad sanitary surroundings and who did not know how to look after themselves. Consequently they had, many of them, before entry, become infected with hookworm and malaria and venereal disease, and classes had to be held to teach them the use of water-closets and toilet paper. They were unaccustomed to the better food of the Army; they did not wash their hands before meals; they expectorated everywhere and could not see any harm in that; they required more bedding and clothing than others and they were easily fatigued. As very few were immune they rapidly developed these infections. The better the hospital accommodation in the camps, the more quickly cases "going sick" were sent there, the fewer the deaths from pneumonia. Overcrowding is considered a cause of infectious disease prevalence, but little weight is given to that, and ventilation is hardly mentioned. Still, it is noted that officers, who are less crowded, more often escape these diseases. It is observed that officers, too, are generally less fatigued. In one camp the men who did guards suffered most; the quartermaster's staff, the cooks, and the officers escaped. Faulty quarantine also did great harm. It is hoped that in future recruits will be sent to observation camps to begin with, there to be quarantined, vaccinated, and taught hygiene and a little physical drill before they are transferred to the large camps to undergo military training.

A TRIBUTE TO SIR LEONARD ROGERS, I.M.S.—The Calcutta School of Tropical Medicine, which already possesses a portrait of Sir Charles Pardey Lukis, has now a memorial to the work of Sir Leonard Rogers, the professor of pathological medicine in Calcutta Medical College. A bust of Sir Leonard Rogers has been unveiled by Lord Ronaldshay.

THE LANCET.

LONDON: SATURDAY, JANUARY 18, 1919.

Industrial Efficiency and Preventive Medicine.

THE physical inefficiency of our industrial classes is one of the spots in our social organisation which, hitherto dark, the searchlight of war has all too brilliantly illuminated. Our national unreadiness for war was most marked not in the fighting forces but in the industrial organisation behind these forces. Our Army may, as regards size, have been "contemptible," but it was constructed on a model which withstood the test of tenfold multiplication. The call of the Army for men, on the other hand, laid bare an appallingly low standard of physique among men of fighting age; and when this call had, so far as was possible, been met, our industries, particularly the munitions industry which supplied the fighting forces with their life-blood, had to rely mainly upon the fit in our population, who were over military age, and much admirable female labour. Then the discovery was made that owing to the conditions of industrial life during the past half-century there were but few skilled craftsmen over the age of 50 who had not already "gone West." Now the war is over, and attention is being given to reconstruction and reorganisation: and nowhere is fresh effort and new work more called for than in trying to ensure for the future generation a higher standard of health among the industrially employed. Two questions call for prompt reply: Who is to be entrusted with the effort which is needed? and How is the effort to be carried out?

The questions are really one, for the methods adopted will to great extent depend upon the agency selected. In the past what has been done to improve the lot of the worker has been carried out by the Home Office administration of the Factory Acts, Shops Hours and Mines Regulations Acts, and the Coal Mines (Minimum Wage) Act, and a decision must now be arrived at as to whether action concerning health and industry in relation to labour is in the future to be administered by an office destined, according to the Haldane Committee[1] to become a Ministry of Justice. If the decision is against the Home Office continuing in charge of the work, should the administration be entrusted as a health question to a new Health Ministry, or as an employment matter to the Ministry of Labour? There is much counsel, and as usual the old adage "In the multitude of counsellors there is wisdom" falsifies itself, because each counsellor counsels differently, and the adage does not indicate how the wisdom is to be sifted out from the multitude. For once, however, on an admittedly difficult question, we have before us advice flowing from two separate sources which is in close agreement. First, the Haldane Committee are definite and explicit:

> "We are satisfied that the inspection and regulation of conditions affecting the health and safety of industrial workers are matters for which the Minister of Employment, and not the Minister of Health, must be responsible to Parliament. ..... The ordinary methods of consultation (between two departments) will probably require to be supplemented from time to time by the appointment of special committees, on the principles which have proved conspicuously successful in the case of the Health of Munition Workers Committee, to advise the Minister of Employment upon problems of industrial health which are new in kind or have assumed a peculiar importance or urgency."

Secondly, the Association of Certifying Factory Surgeons[2] has recently prepared a report upon this subject and state:

> "We think, however, that early arrangements should be made for transferring the whole of the Factory Department from the Home Office to the Ministry of Labour. It appears to us that the Ministry which has the economic problems of labour under its care and direction is the proper body to take charge of occupational health and safety problems, but we are particularly influenced in our view by the conviction that Labour Exchanges could be made into such useful adjuncts to medical examination by securing for young people employment suited to their physical condition. We are also of opinion that the health and welfare measures established by the Ministry of Munitions could be more suitably carried on by the Ministry of Labour than by the Home Office."

Clearly, then, the balance of opinion would favour that the Ministry of Labour (or, as the Haldane Committee prefer it to be called, the Ministry of Employment) should be entrusted with the duty of organising industrial health supervision. There remains for consideration—How is the end in view to be attained? An answer to this question is hardly to be sought from the Haldane Committee, for it was not within their terms of reference, but the report of the certifying factory surgeons contains many valuable suggestions as to the way in which the work could be done by linking up the Employment Exchanges with the Medical Factory Service, especially in relation to juvenile employment. We would here express a word of regret that adults are not more fully considered by the Association of Certifying Factory Surgeons, feeling, as we do, that only by close and intimate association between the Employment Exchanges and the places of employment can any coördinated attack be made upon what is to-day the most serious economic loss in industry—that due to the turnover of labour, and the resulting wastage of workers. Our readers should in this connexion be familiar with the admirable report issued from the Medical Research Committee on the wastage of female labour in munitions factories.[3] Apart, indeed, from the serious loss thus indicated, social economy is not served by sending A 1 men to work which could be carried out by C 3 men, while to send C 3 men to attempt A 1 work is homicidal.

We desire to see every employer of labour with the whole- or part-time services of a doctor at his disposal to advise him on welfare and health

[1] Report of the Machinery of Government Committee (Cd. 9230). H.M. Stationery Office, 1918. Price 6*d.* net.

[2] Report on Reconstruction of Factory Medical Service. Manchester Coöperative Printing Society, Ltd., 118, Corporation-street, 1918.

[3] Medical Research Committee: A Report on the Causes of Wastage of Labour in Munitions Factories Employing Women. H.M. Stationery Office, 1918. Price 1*s.* 6*d.* net.

matters; to examine new workers; to watch over the health of his whole staff; to supervise the hygiene of his establishment as regards ventilation, light, temperature, cleanliness, and first-aid appliances; to advise and help the Welfare Department; to be, in fact, an industrial medical officer of health. Such officers should also be retained to advise the local employment exchanges as to the type of worker to be drafted to this or that trade or process. They should also be employed to conduct the periodical examinations of juveniles industrially employed as will be required under the provisions of the Education Act, 1918, and so to coördinate the school and factory medical supervision. Such local officers would require to be directed and assisted by a medical organisation controlled from headquarters—a nervous system of which the local service would be the peripheral end-organs. The value of such a medical organisation, associated with the Government Department concerned with employment, would be incalculable not only to carry out investigations and assist research into the effect of industrial conditions and hours of labour, but also to influence the adoption of health reform based on sure knowledge so obtained. Probably in the whole field of preventive medicine nothing more urgently calls for action than the establishment of organised medical supervision of employment on sound lines; probably no field promises in return for cultivation a finer harvest of results. In the past unfavourable conditions of employment, overwork and fatigue have caused irritability and labour unrest, impaired physique and disease.

"The subject of industrial efficiency in relation to health and fatigue is in a large degree one of preventive medicine, a question of physiology and psychology, of sociology and industrial hygiene. ..... Without health there is no energy, without energy there is no output. More important than output is the vigour, strength, and vitality of the nation."[4]

Thus the final report of the Health of Munition Workers Committee in the sentences we quote summarises the whole great truth. In the immediate future the nation, as never before, must obtain industrial efficiency through preventive medicine.

Accurate Diagnosis in Appendicitis.

DURING the last 30 years the rôle of the appendix vermiformis in health and disease has been a frequent topic both in medical and lay circles. Before that time little of ill had been laid to its charge; if a criminal, its crimes remained undetected. But at the present time it has become the pathological scapegoat, every pain and ache below the diaphragm casting suspicion upon the appendix; so that the hand of every surgeon is against it. In spite of the attention that it has received the fact remains that the normal appendix has not been sufficiently studied, not only in its anatomy but also and especially in its physiology, and there are questions as to the activities of the appendix which have not, hitherto, received any very definite answers. The means to accurate diagnosis are not yet at our disposal. In the present issue of THE LANCET is an important paper by Dr. E. I. SPRIGGS on the normal anatomy and physiology of the appendix as revealed by the aid of X rays, and the paper is illustrated by accurate coloured drawings and a large number of admirable skiagrams taken by Mr. O. A. MARXER. The X rays have already been employed to a certain extent in the investigation of the appendix but the observations in this paper are more complete and more thorough than anything that has preceded them.

The first thing to be settled by Dr. SPRIGGS and his collaborator was the best material for the opaque meal when it is required to demonstrate the appendix, and it was found that buttermilk and barium sulphate formed the most suitable opaque meal. Moreover, the best results were obtained when the bowel had been previously thoroughly emptied by castor oil. With these preliminaries adjusted, much physiology was made clear by the ensuing observations. In the first place, it became certain that even in health some of the contents of the cæcum enter and leave the appendix, that it fills when the cæcum fills, and that when the contents of the cæcum pass on their way the appendix discharges what it has contained, though sometimes the emptying of the appendix may be a little delayed. In the young, indeed, the appendix may fill and empty several times while the cæcum is still full. It is also certain that in the young the appendix is much more lively than in those who are old. The appendix was seen by Dr. SPRIGGS to move actively; some times the movement occurs as the organ fills, and sometimes without any reference to the passage of material into or out of it. So that we have learned much from these researches as to the conditions of the appendix when it is normal, something of its physiological movements, but, alas! we have learned nothing to enable us to answer the important question whether the appendix has a function or not. That it may be removed without any obvious impairment of health is no proof that it is valueless, for the spleen can be, and has many times been, removed without the least harm resulting, and yet no one would deny that the spleen is of functional importance. The persistence of the appendix, and its active movements, certainly do suggest that it may have some function in the economy of the human body, small though that function may be.

These investigations further afford us much insight into the pathology of the appendix, although such technique can be employed only in cases of chronic appendicitis, for in the acute form the time needed to prepare for and to take the skiagrams must not be spared. But in cases where the diagnosis of chronic appendicitis has not been definitely made, and when there are obscure pains in the abdomen of long duration and uncertain cause, it is all to the good if a diagnosis can be made whether there is or is not definite disease of the vermiform appendix. When sufficient skill

[4] Health of Munition Workers Committee, Final Report, Industrial Health and Efficiency. H.M. Stationery Office (Cd. 9065), 1918. Price 2s. net.

has been acquired and when adequate care is taken it is found that very great reliance can be placed on the appearances presented by the skiagrams, and Dr. SPRIGGS and Mr. MARXER are to be heartily congratulated on their work. They found that it is often necessary, as in the case of the X ray diagnosis of disease in other parts of the alimentary canal, that repeated observations should be made to determine whether the conditions indicated are temporary or permanent. By these means they have found it possible to say whether there are constrictions or kinks in the appendix, whether concretions are present or not, whether the appendix is dilated, and whether adhesions exist. If the appendix always occupies the same position, if manipulation with the hand cannot induce it to move, then we may be sure that adhesions exist which chain it down to one place. In one case brought forward by the authors the appendix gave all the indications of being healthy and empty, yet at a subsequent examination two small shot were seen in it; but they gave rise to no symptoms, though the appendix emptied itself more slowly than before, for it was found to contain some barium sulphate 24 hours after the cæcum had discharged its contents. The appendix was examined every week, and three weeks later the shot had gone. This interesting observation shows us that foreign bodies may not only enter but may also leave the appendix. That the diagnosis made by the X rays may be considered trustworthy we learn from Dr. SPRIGGS, for in all the cases in which a subsequent operation was performed the condition found was that which had been recognised on the skiagram. Thus there can be no doubt that we have in the use of the X rays a valuable aid in the diagnosis of chronic appendicitis, just as there can be no doubt that the information needs highly skilful record. The work of Dr. SPRIGGS and Mr. MARXER has been very thorough, and must have entailed great expenditure of time and pains well directed. The illustrations showing the actual skiagraphic appearances are sufficient guarantees of the practical worth of the research, for by the methods adopted information can be obtained that is otherwise unavailable—information which may either render operative measures unnecessary or much reduce their duration.

In this issue of THE LANCET, also, Mr. S. T. IRWIN, of Belfast, gives a careful classification of the forms of acute appendicitis, supported by some effective coloured drawings, and he claims that it is possible to discriminate definitely between the several varieties before the abdomen is opened, though many surgeons will hesitate to concur. He points out that in the obstructive form the attack always begins with the sudden onset of pain, and he believes that this suddenness is characteristic of the obstructive form, certainly the most dangerous of all the varieties. He shows that it is the obstructive form which on rupture gives rise to widespread peritonitis, for the pus which the appendix contains is at high tension, and only rarely is it that adhesions exist to confine the infection. In these obstructive cases the essential in the treatment is early operation, for the rate of mortality rapidly increases with delay, and few of the cases in which the appendix has given way end in recovery. Mr. IRWIN rightly insists that the remedy for the high mortality in cases belonging to this category lies in the earlier operation, and the possibility of this depends mainly on the doctor who is first called to see the patient. In only too many cases is the surgeon told that the doctor has not urged the need for an operation, that he has tried soothing remedies which sometimes succeed in masking the serious nature of the attack—even the cessation of pain, which not rarely occurs on the onset of gangrene, has been mistaken for real amelioration. With the medical profession lies the onus of impressing on the patient and his friends the necessity for an early operation if the patient's life is to be saved in these cases. Correct diagnoses should be made in cases where the symptoms are well marked and the history is clear. The illustrations accompanying Mr. IRWIN'S paper show appendices in varying conditions immediately after removal, and illustrate appearances which are, of course, completely lost in preserved specimens.

The Harvard Medical Unit.

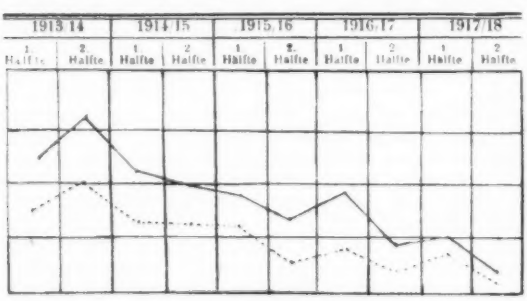
AFTER three years of friendly coöperation with the British Army Medical Corps in France, the Harvard Medical Unit is passing through London on its way back to the United States. In 1915 Colonel HUGH CABOT gave up his assistant professorship of genito-urinary surgery at Boston, with Dr. G. C. SHATTUCK and a group of colleagues, determined to offer us any help they could during the war and to see the business through to the bitter end. The Harvard Unit consisted of American medical officers and nurses with English personnel, at first under the command of Sir ALLAN PERRY, and from October, 1915, on with Colonel CABOT as chief. A most excellent friendly feeling has prevailed throughout amongst the members of the unit and between them and their British helpers, and has been no mean factor in that close professional relationship which has been springing up between American and British officers. The position of the unit has enabled it to form independent views on the important topics of war-time surgery. Their experience, Colonel CABOT tells us, gives no support to the belief that any of the new antiseptics and ingenious methods of applying antiseptics will have any permanent place in surgery. No antiseptic has yet been produced which may not do as much damage to the human tissues as it does to the micro-organisms. Antiseptic, in distinction to aseptic, surgery has not, in the opinion of the unit, gained strength by the experiences of the war. Direct blood transfusion, on the other hand, Colonel CABOT thinks, would gain by more frequent use, the simple method practised in America being preferred. The permanent record of the Harvard Medical Unit is still to come, but whatever the value of the scientific work it contains, the contribution made by the unit to a friendly feeling and a sympathetic understanding between the two Armies will be no less permanent. The war has done much to draw the two English-speaking peoples together, and we warmly endorse Colonel CABOT'S expressed desire to make this *rapprochement* more intimate by the interchange of students, both before and after graduation, providing for the purpose a large scholarship fund available for promising students on either side of the water.

Annotations.

"Ne quid nimis."

WAR CURES.

MUCH stress has been put, and rightly, on war diseases. That way progress has lain. But there have also been war cures, and of these we have heard less. The disappearance of functional nervous disease among the civil population during the last four years is, however, a matter of general comment. In Berlin we understand that migraine disappeared completely from the month of August, 1914, and, without doubt, the work of general practitioners in this country has been mitigated by the fact that they have seen fewer minor ailments. Many of these, while real enough, are such as the patient communicates only to his or her (generally her) family doctor, and the particular family doctor has generally been away. Minor ailments cannot be assessed in actual figures, but there is a certain amount of evidence accumulating in regard to definite morbid conditions which have become numerically less frequent during the war. Dr. Herbert Elias and Dr. Richard Singer laid before the Vienna Medical Society on Oct. 18th last a therapeutic study[1] of the influence of war diet upon diabetes. Their conclusion is based upon figures, and it is a remarkable one. All degrees of diabetes as it occurred in Vienna were favourably influenced by the altered circumstances of war, in males almost without exception, in females frequently but by no means universally. The chart which we



reproduce here shows the decreasing number of diabetics dying in the Vienna General Hospital during the last five years, the thick line indicating total deaths, the interrupted line the deaths occurring in coma. The authors express regret that they cannot give the result in percentages, inasmuch as the total diabetic admissions to hospital could not be ascertained, but of the general lesson to be drawn from the chart there appears to be no doubt. The better war prognosis in males as distinguished from that in females is a fact claimed by these observers as a new observation, coinciding with their pre-war experience, for which they venture to advance no explanation. In the case of patients with slight glycosuria the difference between war and pre-war experience was very striking. Whereas not one of 29 slight diabetics before the war could be regarded as cured, 33 out of 39 became sugar-free under war conditions. The experience of Bouchardat during the siege of Paris in 1870–71 is quoted as having been similar. G. Klemperer, P. F. Richter, and others have noted the increased carbohydrate tolerance, and have made similar observations in enemy countries during the present war. The cure of diabetes is perhaps of greater interest than the disappearance of obesity, of gout, and of chronic constipation noted during the same period and the increasing rarity of eclampsia in pregnant women. The balance is not equalised by the alleged increase in the frequency of peptic ulcer. Any observations of a similar character made in this country would be of interest and might throw useful light on the relation between habit and metabolic disorder.

[1] Wiener klin. Wochenschr., Nov. 21st, 1918.

BRONCHO-SPIROCHÆTOSIS.

THANKS to the work of G. A. Lurie,[1] Galli-Valerio, and H. Violle,[2] the subject of broncho-spirochætosis has received considerable light. The condition until recently was only of interest to the tropical practitioner, but lately it has become a serious matter to medical men in Europe, cases of the malady having been reported from Serbia and the Balkanic zone, Switzerland, and France. The condition and its etiological agent were first described in Ceylon in 1905 by Castellani, who later named the causal agent *Spirochæta bronchialis*. His researches were confirmed by S. Branch in 1907 in the West Indies, by Jackson in the same year in the Philippine Islands, and by several other observers, whilst H. G. Waters in 1909 recorded numerous cases from India. The condition was later found in practically every part of the tropics, of special importance being the work of Chalmers and O'Farrell, who succeeded in reproducing the disease in monkeys, and the thorough investigation of Fantham on the morphology of the organism. *Spirochæta bronchialis*, according to the description given by all these authors, is so markedly polymorphic that the suggestion arises whether the term does not cover more than one species or variety of spirochæte. The classical investigation of Fantham[4] seems to prove, however, that the various forms found belong, in reality, to only one species, differing from the spirochætes occurring commonly in the mouth. Fantham discovered the coccoid stage of the parasite, which he believes to be of fundamental significance in the dissemination of the malady. Clinically, three types of the condition are to be distinguished—the acute, the subacute, and the chronic. The *acute type* develops abruptly; the patient complains of headache and rheumatoid pains all over the body; he feels chilly and coughs much, though there is but very scanty mucoid or muco-purulent expectoration. The fever generally lasts from 3–6 days. This influenza-like type of broncho-spirochætosis has given rise to a suggestion[5] that true influenza may be a form of spirochætosis. The *subacute* and *chronic types* of broncho-spirochætosis are of practical relevance, as they may closely simulate pulmonary tuberculosis. In these types the patient often spits up blood, and this, together with wasting, an evening rise of temperature, and, on examination, the presence of patches of dullness and crepitations, may suggest a diagnosis of phthisis. In a certain number of cases, however, the general condition remains good. The first patient seen by Castellani in Ceylon in 1905 was still alive in 1915, and Violle quotes a number of cases in which the general

[1] Journal of Tropical Medicine, Dec. 1st, 1915.
[2] Correspondenzblatt für Schweizer-Aerzte, February, 1917.
[3] Presse Médicale, July 11th, 1918; THE LANCET, 1918, ii., 775.
[4] Annals of Parasitology, July, 1915.
[5] De Verbizier: Bull. Académie de Médecine, Séance 8 Octobre, 1918.

condition remained good throughout the course of the malady. The prognosis of broncho-spirochætosis is, therefore, in most cases, good as far as life is concerned, but relapses seem to be extremely common, and cases of a malignant type, terminating fatally, have been placed on record.

As regards treatment most authors rely on arsenic, whilst others employ change of air, rest, and plenty of nourishing food. Galli-Valerio has used salvarsan with apparently good results. The whole subject deserves further investigation, especially in regard to the geographical distribution of the condition in the temperate zone, and the mode of infection. The practitioner should also be on his guard, as it is quite possible that a certain number of cases which, in the past, have been regarded as pulmonary tuberculosis, even though tubercle bacilli were constantly absent in the sputum, may have been cases of broncho-spirochætosis.

LUNACY IN EGYPT.

WE learn from the Report on Lunacy in Egypt for the year 1917 that the total number of admissions to asylums in that year was 1062, the largest on record. There are still only the two asylums in Egypt, one at Cairo, chiefly for the city dwellers, male and female, and the other at Khanka, where patients from the scattered districts are chiefly sent. The two groups of cases differ materially, general paralysis being common at Cairo but very rare at Khanka. Three different social classes are treated in the asylums, the paupers, those who contribute something towards their support, and the private paying patients. Voluntary boarders are still received. The patients we regret still to find in the parent institution are the criminal lunatics. The increase in the number of admissions is due chiefly to the fact that more patients are sent direct to the asylums and not detained in the local general hospitals; among them are a very large number of pellagrous insane. At both the asylums accommodation is inadequate, with the result that many partially cured patients are prematurely discharged to make room for the more acute cases, and frequently these patients break down again or add to the sum of criminal lunatics. The death-rate is very high in the two asylums, the total number of deaths during the year being 369, or 17·4 per cent. of the number resident. It should be noted, however, that many deaths occurred in patients who had only recently been admitted, due to the fact that they had been kept too long at home. A special hospital for military patients has been constructed out of the former assistant medical officer's house, to which during the year 126 cases were admitted, nearly every form of mental disorder being represented. The residence of these soldiers in the hospital was very short, and no accidents or deaths occurred. The admissions included a large number of adolescent cases, four general paralytics, and only two alcoholics; delusional cases were common, and melancholia occurred more frequently than mania. As to the apparent (or rather attributed) causes of insanity, congenital mental defect and general physical strain due to shell shock or to dysentery, or other debilitating causes, were recorded as common, and there were many relapses, but in the greater number the cause was mixed or doubtful. Turning to the medical superintendence of the asylums we call attention again to the work of Dr. John Warnock, C.M.G., and during his absence on active service of Dr. H. W. Dudgeon. Their administration has been of the highest order, and praiseworthy effort is continually made to carry on scientific investigation; the State laboratory has assisted in the examination of the blood of 100 consecutive admissions, a positive Wassermann reaction being found in many other forms of mental disease than general paralysis of the insane. Blood and fæces were also examined in cases of bilharzia. In each report a table is given showing the number of criminal lunatics admitted, the nature of their crimes, and the form of their insanity. Eighty persons were thus received, namely 72 men and 8 women, and of these pellagrous insanity provided 12, hashish only 1, and G.P.I. 2. Next to pellagra, dementia is given as the most common form of insanity met with. In all there were 400 male criminal lunatics and 37 females. Attempts at murder were common, but theft was the most usual offence, the same applying to the pellagrous insane, while every form of antisocial crime was represented.

TETANUS WITHOUT TRISMUS.

THE enormous medical experience of the war has modified our knowledge of many diseases. Perhaps the most striking example is tetanus. It used to be taught that trismus was a characteristic early sign on which the diagnosis turned in cases of doubt. But the extensive prophylactic use of antitoxin in the wounds of war has produced new types of the disease in which old and well-established rules fail. We now know that the disease may be so mitigated that the spasms may be confined to the neighbourhood of the wound (local tetanus) and trismus or other spasm be completely absent. This form was known previously in experimental tetanus in animals. But the view of the pathology of tetanus brought forward by Professor H. H. Meyer and Dr. Fred Ransom (THE LANCET, Dec. 22nd, 1917, p. 929) that the increased irritability of the nerve centres is due to the passage of toxin up the motor nerves to the spinal cord, in which process the nerves of the infected area are at an advantage, would suggest that tetanus should always be local in onset, and, indeed it has been asserted that if cases are carefully watched from the beginning spasms of the muscles in the neighbourhood of the wound will always be observed. Not only is trismus absent in local tetanus, but, more remarkable, French observers have shown that it may be absent in general tetanus when modified by the prophylactic use of antitoxin. In the December number of the *Medical Review* is given the following case, recorded in the *Lyon Médical* by M. Roubier.

An Arab soldier was wounded in the left hand by a grenade on April 22nd, 1917. On the following day 20 c.cm. of tetanus antitoxin were injected, and eight days later 10 c.cm. On May 8th, when the wounds were healed and he was considered cured, the temperature rose to 102·6° F., and next morning to 105°. He sweated profusely and complained of pain in the neck and a little difficulty in swallowing. There was no trismus, and Kernig's sign was absent. Though the spleen was not enlarged malaria was suggested and quinine given. The temperature fell but rose again, and there were intense headache, slight dysphagia, and some stiffness of the neck. Kernig's sign and slight hyperæsthesia of the lower limbs were found. Blood examination was negative. On May 14th these symptoms persisted, and in certain regions a prick or even grazing of the skin produced local muscular contractions which were not painful. Lumbar puncture yielded normal fluid not under increased pressure. The contractions, which consisted of rapid twitches, not durable contractures, became more intense. On the 23rd the contractions were for the first time painful and there was contracture of the anterior muscles of the right thigh. It was increased on the slightest touch and paroxysms occurred spontaneously which were grafted on to the permanent hypertonia. Spontaneous twitches of the

sub-umbilical region occurred at variable intervals. Improvement began on June 7th and recovery followed. The treatment consisted in the administration of antitoxin and Baccelli's fluid. The absence of trismus rendered the diagnosis difficult. Malaria, septicæmia, and, on the appearance of the cervical rigidity, meningitis were in turn suggested.

Several French papers on tetanus without trismus have recently been published. Montais has shown that the classical form of tetanus which occurred at the beginning of the war became rarer as preventive serotherapy was more methodically applied. Lumière among 54 cases of tetanus after preventive injection found trismus absent in 15 and attenuated or late in appearing in 13. The explanation of the absence of trismus is not clear. A considerable immunity conferred by antitoxin would explain very well local tetanus or the late appearance of trismus as an initial symptom. But why should what are normally the most sensitive centres to the toxin become insensitive while other centres retain their sensitiveness?

HYSTERICAL VOMITING IN SOLDIERS.

THE war has given a great impetus to the study of functional nerve disease, and the literature of this subject promises to become a large and important one. The emotional stress and physical strain produced by the conditions of warfare are such as to provoke various neuroses, particularly in those predisposed to them. When these functional derangements are referred to the viscera their nature is likely to be overlooked. We published in THE LANCET of Jan. 4th an interesting paper on hysterical vomiting in soldiers by Captain W. R. Reynell. He points out that the hysterical nature of vomiting occurring in soldiers is liable to be overlooked and the condition thus often recorded and treated as if it resulted from some organic disturbance, such as gastritis. Captain Reynell gives a valuable definition of hysterical vomiting as "the perpetuation by suggestion of a symptom, due in the first place to a pathological condition such as that caused by gassing, dysentery, phthisis, or appendicitis." He states that gassing is the most frequent exciting cause of hysterical vomiting in soldiers, but he has observed that in a number of cases the vomiting is referred to an attack of dysentery, trench fever, or other infection. In either case the vomiting persists as an hysterical symptom long after the original exciting causes have ceased to be operative. In some cases the origin appears to be purely emotional. The vomiting may occur after every meal or only once or twice a day, while in mild cases there may be intervals of several days and the attacks of vomiting may be traced to emotional upset or to sudden excitement. The vomiting may be preceded by epigastric pain, which is relieved when the vomiting has occurred. It seems to be independent of diet in the majority of cases. There is an absence of any sign of organic disease, though wasting to the extent of the loss of several stones in weight may occur. The examination by X rays after a barium meal shows nothing abnormal and the stomach empties at the normal rate unless vomiting occurs. Captain Reynell states that the diagnosis is not usually difficult and depends upon the persistence of the vomiting in the absence of signs of organic disease, especially where there is a history of gassing or emotional stress. He points out the importance of recognising the hysterical nature of the condition owing to the fact that in a considerable proportion of cases the vomiting persists indefinitely in spite of dieting and treatment by medicines or by rectal feeding, which tend rather to prolong than to cure it. The treatment recommended by Captain Reynell is to impress upon the patient the fact that his case has been thoroughly investigated, and then to explain the origin of the symptom and to indicate that it has now become converted into a habit. If necessary, a stomach-tube is passed before meals for its suggestive effect upon the patient. He is told that it is a method which does not fail, and that it will depend upon him how often the tube need be passed. Captain Reynell found that the vomiting usually ceased after a week or ten days, and that in patients of superior intelligence it is frequently possible for a cure to be effected by psycho-therapy without the passage of a tube. He adds a note to his paper expressing the opinion that hysterical vomiting is frequently overlooked in civil practice, and that many cases of chronic vomiting are hysterical in nature. He goes so far as to maintain that it is probable that most, if not all, cases of the pernicious vomiting of pregnancy are purely hysterical. While we should not be prepared to subscribe to this view without further evidence, Captain Reynell's paper is interesting and suggestive, and should lead to a more careful examination of cases of persistent vomiting of obscure causation in civil practice, in order to eliminate the possibility he suggests of hysterical persistence of vomiting, originally of organic causation, when the primary cause has ceased to be operative.

THE LESSONS OF THE LOUSE.

IN a primitive society feeble folk survive the dangers which beset them either by means of a shyness which withdraws them from taking risks or by a parasitism which claims the protection of something stronger. Like the coney, the louse is a feeble folk which, unlike it, has established its survival by an extreme intimacy with man, and in so doing has come to have a bearing on public health which is only now becoming generally appreciated. Mr. Ll. Lloyd, Lieutenant, R.A.M.C. (T.), whose experience as chief entomologist in Northern Rhodesia entitles him to speak with authority on zoological subjects, deals with this feeble parasite and its menace to mankind in a book,[1] intended avowedly for the general reader rather than for the specialist, the great merit of which is the statement of ascertained facts in a form bringing out the practical hygienic lessons to be drawn from them. Slow, short-lived, and defenceless, the louse has nevertheless been man's close companion from prehistoric times, for Mr. Lloyd considers the body-louse and the head-louse to be slightly divergent forms of a parent species infesting primitive man in his naked and hirsute state. At what stage in its history the louse became the intermediary of pathogenic spirochætes and other organisms is not dealt with by Mr. Lloyd, but would form a very interesting chapter in the history of parasitism. We do not even know whether the louse itself is only the innocent medium of these noxious wares or whether as middleman it derives any personal benefit from the traffic. The first great hygienic lesson which emerges from a study of the facts is that the parasite must be regarded with respect. For untold ages the louse has been the object of shame and jest, but not of serious study, and this unfortunate symbiosis of ideas has been singularly successful in keeping up the still more unfor-

[1] Lice and their Menace to Man. By Ll. Lloyd, R.A.M.C. (T.) With a chapter on Trench Fever by Major W. Byam, R.A.M.C. Oxford Medical Publications. 1919. Pp. 136. Price 7s. 6d.

tunate physical symbiosis essential to its life. Even Mr. Lloyd has a special repugnance for the crab-louse which he describes as an "abominable" insect. Bacteriologists do not brand even the Pfeiffer bacillus. But surely applied knowledge cannot fail to deal with a feeble creature which lives for but 40 to 50 days, has little or no means of finding a new host, and soon dies of starvation when removed from the human skin on which its normal habit is to dine at least four or five times a day. The second lesson is that of thoroughness. Although so easy to kill, dying at a mere touch, on being dried or slightly warmed the failure of even drastic methods applied without system to extirpate it has resulted in a deeply-rooted notion that the louse arises spontaneously from the ground. Our soldiers in the South African War shared this belief with the Egyptians of Pharoah's time, before whose eyes the dust became lice. But disinfestation—as the phrase now runs—is only a question of thoroughness. In the Army at first only the man's shirt was disinfested, leaving his other garments as a safe refuge for the parasite. Then the whole clothing was treated, overlooking the hair, in which lice or nits still lurked. And, finally, the failure to deal simultaneously with the whole body of troops resulted in the ready re-infestation of the disinfested section by adjacent and still infested men. It was on the Eastern front that this lesson was most strikingly illustrated by Colonel W. Hunter's great achievement with the Stammers method, in which men's kits by the ten-thousand were sterilised by live steam in a special railway van.[2] The problem, Mr. Lloyd tells us, is a difficult one to solve under civilian conditions, but it is through the diffusion of the knowledge acquired under war conditions that the solution will come. The clear and concise knowledge imparted in this book should greatly help the civilian campaign against the louse. An illustrated poster just issued by the British Museum of Natural History at South Kensington at one half-penny, entitled "The Louse Danger," will help in the same direction.

A CONFERENCE ON THE TUBERCULOSIS SERVICE.

THE larger aspects of the tuberculosis question were just beginning to be seriously faced when the European upheaval put an end to all constructive labours. The position has been rendered vastly more urgent by the war, and public opinion has become less tolerant of delay. On the Tuberculosis Service of the country will rest a very heavy responsibility in the years ahead of us. The Tuberculosis Society foresees the need of strengthening the hands of those on whom the responsibility will fall and has arranged for a conference to be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., at 7 P.M. on Saturday, Jan. 25th, to discuss the status of the Tuberculosis Service under forthcoming legislation. Matters coming specially within the limits of the discussion are the scope of the tuberculosis officer's work, his relation to the present Public Health Service, his remuneration, security of tenure and superannuation; and it is hoped that the discussion may lead to a comprehensive and united policy for the control and eradication of tuberculosis, and be attended not only by tuberculosis officers, in the strict sense, but also by medical officers of sanatoriums, open-air schools, farm colonies, and tuberculosis hospitals. Resolutions to be submitted to the conference will be based upon the memorial passed by the Tuberculosis Society in 1914 and submitted at the time to members of the Government. The claims then made were that tuberculosis officers should be regarded as an independent service so far as their clinical duties are concerned, and be responsible for the management of institutions to which they are attached; that a satisfactory status and security of tenure should be secured for them; that the Tuberculosis Service should not count as a subsidiary branch of the Public Health Service; and that security of tenure and superannuation should be ensured for its members comparable to those ruling in the Lunacy and Prison Services. We trust that the conference will herald the development of the united policy which its promoters foreshadow.

[2] THE LANCET, Sept. 14th and 21st, 1918.

PROPHYLACTIC MEASURES AGAINST INFLUENZA AT A PUBLIC SCHOOL.

THE responsibilities of those in charge of institutions, particularly public schools, at the present time are heavy, and any statistical results of prophylactic measures adopted must be welcome. We publish in our present issue an interesting note by Mr. G. E. Friend, medical officer of Christ's Hospital School, West Horsham, to which we may draw our readers' attention. After a small outbreak in the summer term, to which we will refer later, measures were taken to minimise the risks of infection as far as possible. The school being self-contained and enclosed by a ring fence, Mr. Friend advised the headmaster at the beginning of the winter term to stop all leave and keep the boys strictly within bounds—walks outside being allowed, but the town, 2½ miles away, and all houses off the school estate were put out of bounds. Segregation was, however, only possible to a limited extent, since visitors could not be kept away, and large numbers came twice a week, some of them staying over the week-end; nor could all leave of absence be stopped. Non-resident masters and servants were also possible sources of infection which could not be prevented. The time allowed for sleep had previously been increased by one hour and the amount of work and play reduced. The nasal drill described in THE LANCET of August 24th, 1918, by Dr. Isabel Ormiston was carried out twice daily. A polyvalent influenza vaccine, unmixed with other organisms, prepared by Dr. E. L. Hunt, was given to about 77 per cent. of the boys in a single dose—boys over 14 years of age receiving 70 million, those under this age 30 million. In all, 633 boys were inoculated, 306 receiving the larger dose, and 327 the smaller. Only 39 boys' parents objected to inoculation, but 128 boys were considered unsuitable, and 19 boys were absent, ill, so that 186 boys were not inoculated. Only one definite case of influenza occurred during the term, and the cases of medical illness were less than in any term since 1898. The one case was that of a boy—inoculated with 30 million of vaccine—who went home to attend the funeral of his mother who had died from influenza. He developed coryza and cough and slight fever, and apparently suffered from mild influenza. In addition there were 36 cases of "chill" of very mild character which clinically could not be regarded as influenza, and they were not examined bacteriologically. Inoculation was only carried out on Oct. 30th—i.e., at about half term—and 12 of the cases of "chill" occurred before this date. Of the 24 cases occurring after

inoculation 7 were among the uninoculated—i.e., 4·2 per cent., and 17 among the inoculated—i.e., 2·6 per cent. From September onwards influenza was very prevalent in Horsham and in all the surrounding villages. About 18 cases, 3 of them complicated by pneumonia, occurred among the staff, and these were at once isolated. Mr. Friend attributes the gratifying freedom from influenza among the boys to physical training, nasal drill, an increase of the caloric value of the diet, and to the inoculation. To this we may add that prompt isolation of the cases occurring among the staff was also no doubt a valuable precaution. It is somewhat difficult to appraise the actual value of the inoculations owing to the absence of any outbreak of the disease among the boys from the success of the general measures adopted.

A small outbreak in the summer term mentioned by Mr. Friend is worth a brief reference. In the ten days previous to July 20th 21 cases of mild influenza occurred in various houses of the school. On the date just mentioned the cricket eleven went to Brighton to play a match. Next day five of the team were admitted to the infirmary, together with three other boys who were not in the team, but came from the same houses. Within the next four days 31 other cases were admitted, nearly all from the houses which had supplied the cricket team. Mr. Friend attributes this outbreak of 39 cases to the Brighton visit of the cricket team rather than to the 21 mild cases previously present. We do not feel quite convinced of the correctness of this explanation, since it involves a very short incubation period even for the five members of the cricket eleven, and an even shorter one for the three boys who were admitted to the infirmary on the same day, who must on this supposition have been infected by the five players during the early part of their incubation period. We may recall the interesting observations published by Major Michael G. Foster and Major H. Anstey Cookson in THE LANCET of Nov. 2nd, 1918, in which the incubation period of influenza seemed to be about 48 hours.

Sir David Bruce has been elected a Correspondent of the Académie des Sciences.

Sir Anthony Bowlby will deliver the Hunterian Oration at the Royal College of Surgeons of England on Friday, Feb. 14th, at 4 P.M.

AFTER having completed 20 years' service on the full staff of St. George's Hospital, according to the regulations, Sir Humphry Rolleston has ceased to be physician to the institution. But instead of automatically becoming consulting physician, which up to the present time has been the unbroken rule of the hospital, the house committee, on the recommendation of his colleagues, has appointed him emeritus physician for his lifetime, with the privilege of using the clinical material in the wards for teaching.

THE LANCET, VOL. II., 1918: THE INDEX.

THE Index and Title-page to the volume of THE LANCET which was completed with the issue of Dec. 28th, 1918, is now ready. Subscribers who bind up their numbers are requested to send a *post-card* (which is more convenient for filing purposes than a letter) to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

MEDICINE AND THE LAW.

The Irregular Sale of Poisons.

AT a recent inquest upon a police superintendent at Hemel Hempstead the evidence showed that the deceased, who had had to give up his position owing to his period of service having come to an end, had taken his life with prussic acid, and that he had been able to purchase the drug without complying with the regulations imposed by the Pharmacy Act. He had told the druggist who sold it to him that he wanted it in order to kill a dog, and the druggist, according to his own version of the transaction in the witness-box, had "presumed he would be all right in serving the police." The witness in question will no doubt have received a lesson which he will never forget, and in future will carry out to the letter any legal enactments which may affect his business. Probably he disregarded it in this instance because he thought that the local police superintendent was one who, of all others, would not be likely to make an improper use of his purchase, but he might have remembered that he was also the last person who should have tempted him into an irregularity such as he committed. The sale of dangerous drugs in contravention of the law which seeks to restrict and to supervise such transactions, no doubt, takes place not infrequently, and recent cases have shown that in relation to some drugs, after they have left the hands of the legitimate retailer, a substantial profit may be made by surreptitiously disposing of them. At another inquest, held at Isleworth, it was shown that the deceased, an elderly woman, experienced no difficulty in obtaining morphia from a firm of druggists in London by sending a succession of written orders, and that she received it in quantities of about 45 grains, one consignment lasting her for not more than three days. A prescription was mentioned as having been used by her, but particulars of it were not given. Her way of taking the drug was to moisten a finger with saliva, draw it across the packet of powder, and suck it. The medical officer of the infirmary in which the woman died ascribed death to valvular disease of the heart and congestion of the lungs, expressing at the same time an opinion that it had been accelerated by chronic morphia poisoning. The coroner observed that the druggist had been "very slack—to put it no higher."

Medical Practitioners and the Detection of Crime.

It is to be hoped that the publicity given by the newspapers to the case of William Henry Gordon, described as an analytical chemist, with an address in Pall Mall, will be a useful lesson to druggists and others that the treatment of venereal diseases has been directly entrusted to the medical profession by the Venereal Diseases Act, 1917, and that in areas where that Act is in force there are heavy penalties provided for unqualified persons who attempt to administer such treatment. Gordon, it will be remembered, was recently sentenced by Mr. Denman at Marlborough-street police-court to pay a fine of £100 and £21 costs, or, in default, to undergo imprisonment for three months for having prescribed treatment and given advice to a member of the police force who was in good health and who had been sent to him for the purpose of detecting and convicting him. The sentence was well deserved, and Mr. Denman intimated that a more severe one would have been passed if another case mentioned had been proved before him, in which a person who had visited Gordon as a bona-fide patient was stated to have been treated by him as if for venereal disease, although, in fact, he was as free from it as was the police detective. The case upon which the conviction took place was, in short, a well-laid trap which will have had a desirable effect if it has procured the punishment of an offender, and if at the same time it serves as a warning to others. It has been, moreover, the result of action on the part of the National Council for Combating Venereal Diseases, whose late honorary medical secretary, Dr. Otto May, arranged the introduction of the police detective to Gordon, giving him a letter which he presented on his first visit to the defendant's office. In congratulating the National Council for Combating Venereal Diseases on its success we venture, however, to express a doubt as to the desirability of a member of the medical profession intervening directly in the detection of offenders in this or in other classes of criminal acts. We d

not question that Dr. Otto May, actuated by a sense of public duty, brought about with certainty a conviction which it was desirable to secure without failure through the omission of any detail. We are, nevertheless, of the opinion that medical men on such occasions are entirely within their proper sphere in giving necessary scientific evidence after qualifying themselves to do so by observation of the facts relevant for that purpose, and that by going further than this they travel out of that sphere without the justification that their action is necessary and indispensable. In other words, there are functions, such as acting when suitable the part of the *agent provocateur*, which rightly are performed by the police as everyday official duties and which are best left to them. If we were to hold as a matter of principle that a medical man should be willing, at the request of the police, to introduce a supposed patient to someone who in the name of medicine was likely to attempt a crime, one more step would take us to the point where such action would be looked upon as obligatory. The nature of the criminal offence is immaterial, but a parallel may be drawn between the treatment of venereal diseases and the more serious case of abortion. We can well imagine an occasion when a man suspected of procuring miscarriage in pregnant females might usefully be brought to justice by means of a sham subject employed by the police. Such a man might be a member of the medical profession, a regrettable black sheep whom many of his colleagues would gladly see brought to book. We should not, however, regard it as desirable that the actual bringing of the supposed pregnant woman into touch with the suspected person should be the work of a medical colleague. And yet the fact of the suspect being a medical man would not affect the question of his being a person whose detection was desirable, and in conceivable circumstances such an introduction of the supposed patient as we have suggested might be extremely effective in bring about that end. We prefer, nevertheless, to distinguish in such matters between the duties of those professionally entrusted with administering and enforcing the law, and duties which devolve upon medical men as citizens invited to assist in a limited degree in deference to their special qualifications for so doing.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Irish Medical Committee.

A MEETING of the Irish Medical Committee was held early in the month to discuss various matters affecting medical interests in Ireland. Mr. R. J. Johnstone, of Belfast, and Dr. Joseph Power, of Co. Tipperary, were re-elected chairman and vice-chairman respectively. Several grievances arising out of the working of the National Health Insurance Act were discussed, and the attention of the Commission was directed to be drawn again to the continued impropriety of permitting the Approved Societies to appoint the medical referees who are paid out of public funds. The Commission in 1915 pledged itself that it would retain all such appointments in its own hands. The opinion was expressed by the Committee that the remuneration for certification was, under present conditions, quite inadequate. The Committee considered the failure of many Poor-law unions to adopt graded scales of salaries for their medical officers, and decided to press the Local Government Board to use their powers to fix adequate salaries in the case of such unions. The probability of the Irish Government proceeding to introduce a Health Reform Bill for Ireland was also discussed by the Committee, and a watching committee was appointed to report any information that might be gained as to the intentions of the Government.

The Ministries of Health Bill.

All those who have the true interests of Ireland at heart were surprised to learn, on the introduction of the "Ministries of Health" Bill last session, that it did not apply to Ireland, and in a speech delivered in Belfast on Nov. 15th, 1918, Sir Edward Carson, M.P., said that as soon as he learned from Dr. Addison, M.P., that Ireland was to be excluded he put down immediately a resolution to move that the House of Commons refuse to go on with the Bill until Ireland was included. Ireland may have been excluded either on political or non-political grounds. In a medical journal I do not enter into controversial matters like politics, further than to say that surely—even in a divided country like Ireland—people might agree on a question affecting their health, no matter what religious or political opinions they held. Yet what non-political reasons could be assigned for keeping Ireland out of a health measure, except that, owing to the backward state of public health in that country, it could not be treated simultaneously in the same way as England and Scotland? And so Ireland must have a measure for herself alone. For many reasons, in both Scotland and England, public health is half a century in advance of what it is in Ireland, where there are full-time officers of health only in the few county boroughs, while in the whole country there is not a county medical officer of health. There are no primary school boards, with the result that medical inspection of schools does not exist, and in the Insurance Act medical benefits in Ireland are conspicuous by their absence; while a Central Midwives Board was established in England in 1902 and in Scotland in 1915, the Irish Board came into existence only towards the end of 1918 and is not yet in full practical activity. If ever there was a country which needs a thorough reorganisation on modern lines of its public health conditions it is Ireland, and it is, therefore, to be hoped that when the new measure so much talked of at present—to coördinate health departments—is introduced, it will either include Ireland or give us a separate measure dealing with our country.

The Salaries of Dispensary Doctors.

The dispute between the dispensary medical officers and boards of guardians in reference to increase of salaries is rapidly approaching a crisis in the north of Ireland. At Derry the matter is still unsettled, and at Ballymena no action was taken on Jan. 4th, although a week later the guardians yielded to a threat of resignation. At Coleraine on Jan. 4th a letter from Dr. H. S. Morrison, secretary to the County Medical Committee, to the effect that he was instructed to say that the proposed scale of increase passed by the guardians was inadequate, making the initial salary £125 instead of £100, rising to £175 instead of £150, with special scale for the Coleraine Dispensary of £150 of initial salary, rising to £200, was marked read, and no satisfactory arrangement has been made. At Omagh the Local Government Board have sanctioned the increase of salaries of each of the medical officers of the union from £100 to £140 and the granting of three quinquennial increments of £10 each till a maximum of £170 is reached. The Belfast guardians are to consider the question of the request of their medical officers for an increase in their salaries at a special meeting.

Health of Belfast.

At the January meeting of the Belfast City Council, in seconding a resolution to the effect that the Infectious Disease Notification Act, 1889, shall apply in Belfast to the disease known as septic pneumonia (i.e., influenza), Mr. J. H. Stirling, a leading councillor, blamed the health authorities for taking no action until Dec. 7th last, and pointed out the admitted want of knowledge of the medical profession as to the nature of the epidemic or as to its real causation. It appears that the deaths for the four weeks ended Dec. 14th, 1918, were 863 from all causes, and of these 250 were attributed to chest affections. In reply, the chairman of the public health committee took the line that it was no part of the duty of the Belfast public health committee to set up a department of research to find out the cause of influenza, which, he declared, was entirely outside their jurisdiction. Their duty was to administer the law, and it was for the Universities or the Government to undertake research work. In other words, notwithstanding the fact that the Belfast City Council have a medical officer of health, a pathologist, a tuberculosis health officer, and numerous doctors (all paid) engaged at centres for child welfare, and with the rates of the city for public health work steadily rising, the whole business they are to do is, according to the chairman of the public health committee of the city of Belfast, to administer the law. Is it any wonder that in Belfast for 1918 we have a high general mortality rate and high rates for tuberculosis and infantile mortality? "To administer the law," says the chairman of the public health committee of the great city of Belfast, is all the duty that the health authority has to do. Let others bother themselves about the research work necessary to find out the cause and, as a natural corollary, the means of preventing and treating disease.

The War and After.

THE CASUALTY LIST.

FOR the first time for very many weeks past we have not to make any announcements of casualties amongst the members of the medical profession engaged in the war.

We are glad to learn from Dr. J. S. Martin, late Captain, R.A.M.C., of Leigh, Lancs, that he is not the Capt. J. S. Martin, R.A.M.C., who was officially reported to have died in the casualty list issued from the War Office on Friday, Jan. 3rd, and published in THE LANCET of Jan. 11th.

OBITUARY OF THE WAR.

JAMES THOMAS McENTIRE, M.B., CH.B., D.P.H. DUB.,

MONS STAR; LÉGION D'HONNEUR;
LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

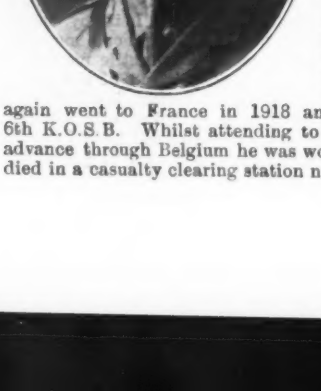
Lieutenant-Colonel J. T. McEntire, who died of pneumonia following influenza at Salonika on Oct. 29th, was eldest son of the late Alexander Knox McEntire, J.P., B.L., official assignee in Ireland. Educated at St. Andrew's College, Dublin, he graduated at Trinity College and took the B.A. and M.B. degrees in 1902 and the D.P.H. in 1911. He joined the R.A.M.C. in 1903, and served in South Africa for five years and on the West Coast of Africa for two years. He went to France from Ireland in 1914 with the original expeditionary force and received the Mons Star. In recognition of his work in the early fighting, in which he was often in positions of great danger, the French Government conferred on him the Legion of Honour after the first battle of Le Cateau. He was further mentioned in despatches on three occasions In 1917, after a short rest at home, he was sent to Salonika in charge of the surgical division of a general hospital, and early this year was given command of a stationary hospital, with the acting rank of Lieut.-Colonel.

Colonel McEntire married Mary, daughter of the late James Little, of Dumfries, N.B., and leaves one daughter.

HENRY PARKS WHITWORTH, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain H. P. Whitworth, who died on Oct. 29th from wounds received 12 days previously, was second son of the late Wm. Whitworth, M.R.C.S. Eng., of St. Agnes, Cornwall. Educated at Epsom College and Guy's Hospital, where he played in the Rugby team during the seasons of 1912–13 and 1913–14, he qualified in 1914, taking the diplomas of the Conjoint Board, and then held several house appointments at his hospital. He joined the R.A.M.C. the same year and was posted to the 26th Field Ambulance. After being severely wounded during the first battle of the Somme in 1916 he again went to France in 1918 and was attached to the 6th K.O.S.B. Whilst attending to his patients during the advance through Belgium he was wounded in the head and died in a casualty clearing station near Ypres.



GEORGE ELPHINSTONE KEITH, M.B., C.M. EDIN.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain G. E. Keith, who died in Italy of pneumonia following influenza on Dec. 6th last, at the age of 54 years, was youngest son of the late Dr. Thomas Keith of Edinburgh. Never robust, he spent a year on a ranch in Texas before graduating at Edinburgh in 1887. He held appointments in Edinburgh under the late Professor Annandale, and in the following year went to New York, where, after taking the M.D. degree at the Long Island College, Brooklyn, he became house surgeon at the Woman's Hospital, and there came in close contact with the leading gynæcologists of America. Before settling down in Manchester-square, London, where he devoted himself more especially to midwifery, he accompanied Lord Randolph Churchill when he went round the world in his vain search for health. He was part author of a text-book on abdominal surgery, and for 10 or 12 years had devoted a large part of his time to the treatment of cancer by injection, the early account of the work being contained in "Cancer; Relief of Pain and Possible Cure." He joined the R.A.M.C. in July, 1915, and was promoted captain in 1916. Although over age, he served with the Expeditionary Force in France and Italy, and was one of the medical officers on the *Britannic* when she was torpedoed in the Ægean Sea. Captain Keith was unmarried.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualty among the sons of medical men is reported:—

Lieut.-Col. G. Buckston Browne, D.S.O., R.F.A., died of pneumonia, son of Mr. G. Buckston Browne, of Wimpole-street, London, W.

THE HONOURS LIST.

The following appointments of medical men to the Most Excellent Order of the British Empire for services in connexion with the war are announced:—

K.C.B.E.—K. N. Burnett, J.P., Chairman of the Economic Committee of the Army Medical Department, War Office; G. A. O'B. Reid; Col. W. H White, R.A.M.C., Chairman and Consultant, Queen Mary's Royal Naval Hospital, Southend.

C.B.E.—H. H. Dale, F.R.S.; A. Eichholz, Senior Assistant Medical Officer, Board of Education; S. Lyle, Commissioner of Medical Services, Ministry of National Service; Col. W. G. Beyts, A.M.S., Assistant Director of Medical Service, Bombay Brigade; Lt.-Col. E. L. Ward, I.M.S., Inspector-General of Prisons, Punjab.

O.B.E.—A. M. Elliot, Headquarters Medical Examiner, British Red Cross Society; A. C. Ferguson, Commandant and Medical Officer, Thirsk Auxiliary Hospital, Yorkshire; J. T. Grey, Donor and Medical Officer, Stanmore House Auxiliary Hospital, Lenham; R. W. Johnstone, Commissioner of Medical Services, Ministry of National Service; J. R. Lunn, Commandant, "The Cecils" Auxiliary Hospital, Chapp-ll Croft, Sussex; H. A. Macewen Medical Inspector, Local Government Board; Capt. L. E. C. Norbury, Surgeon, British Red Cross Hospital, Netley; Maj. D. V. Rees, T.D., Operating Surgeon, Brecon and Builth Auxiliary Hospitals; C. Reid, Deputy County Director, Staffordshire Branch, British Red Cross Society; E. C. Roberts, J.P., Senior Medical Officer, Grovelands Auxiliary Hospital, Southgate Middlesex; Maj. C. S. de Segundo, V.D., Deputy Commissioner of Medical Services, Ministry of National Service; P. G. Selby, Medical Officer, Auxiliary Hospital, Sittingbourne, Kent; G. R. F. Stilwell, Medical Officer, Balgowan Auxiliary Hospital, Beckenham, Kent; G. M Winter, J.P., Chairman, Torquay Food Control Committee; Lt.-Col. F. S. C. Thompson, I.M.S., Superintendent, Presidency Jail, Bengal; F. C. Madden, Senior Surgeon, Kasr-el-Ainy Hospital, Egypt.

M.B.E.—J. Adams; W. S. Aslett, Medical Officer, Knighton Auxiliary Hospital, Leicestershire; W. Baigent, Officer in Charge, Northallerton Auxiliary Hospital, Yorkshire; G. S. Brock, British Red Cross Hospital, Italy; J. Culross, Medical Officer in Charge, Newton Abbot Auxiliary Hospital, Devonshire; G. Hovle, Commandant, The Plains and Brooksbank Auxiliary Hospital, Elland; H. F. Powell, late Transport Officer, Cheltenham Group of Hospitals; J. Simcock, Assistant County Director for Heston Chapel Division, Lancashire Branch, British Red Cross Society; J. C. Smyth, Commandant and Medical Officer, Fairfield Auxiliary Hospital, Malvern; J. Wallace, Commandant, Ashcombe House Auxiliary Hospital, Weston-super-Mare; C. H. Lincoln, Acting Consul, Mohammerah, Persian Gulf.

Correspondence.

"Audi alteram partem."

ETIOLOGY OF LINGUAL CANCER.

To the Editor of THE LANCET.

SIR,—Your annotation on the above subject appearing in THE LANCET of Jan. 11th, in connexion with Mr. D'Arcy Power's Bradshaw lecture, is of the highest interest to the medical and general public, since it contains a grave warning, and prophesies a great increase in the disease unless measures are taken to deal adequately with the predisposing and exciting causes. Mr. Power concludes that syphilis cannot be considered more than the predisposing cause, and he suggests that the increased smoking prevalent in both sexes is the exciting cause.

As to Mr. Power's first conclusion, we know that even extremely severe types of gummatous tongue of long duration may not always develop into carcinoma; and as to tobacco being the exciting cause, as is pointed out, there must be at least another factor, at present unknown. Otherwise, why are not all excessive smokers (or at least a far larger proportion than is the case) also victims of the disease?

In discussing the etiology of lingual cancer it might be well to remember that with but few exceptions, notably that of new growths, affections of the tongue have hitherto been rightly regarded as merely symptomatic of general, or local, disease originating elsewhere, and that there is an intimate, though still obscure, relationship, anatomical and physiological, between the tongue and the stomach, or gastro-intestinal system, the state of the tongue—e.g., the presence of fur, dryness, moisture, swelling, &c.—being a useful index to the presence of various febrile or gastro-intestinal disturbances.

Further investigation may show that we have been mistaken in excluding from this list of diseases, arising from disturbances elsewhere, new growths of the tongue, which, after all, may prove to be due to some cause primarily affecting the stomach. Has the state of the gastric juice in lingual cancer been recorded? In investigating the etiology of lingual cancer, therefore, I urge a closer scrutiny of, and comparison with, the etiology of peptic ulcers, of which condition clinically I have had considerable experience.

We know from Dr. Charles Bolton's experiments that gastric ulcers can be produced by certain toxins, but do we know exactly how, in "atonic dyspepsia," the apparently analogous condition in the tongue, peptic ulceration, arises? Clinically, in my experience, this condition is especially associated with "starchy dyspepsia," an inability to digest certain starches (especially of potato, peas and beans, corn-flour, &c.), and with mental and emotional strains, overwork, and anxiety. Closely allied to this is the question of the "sore tongue" known to smokers, and hitherto generally attributed by them to the tobacco itself.

A prolonged consideration of the etiology of peptic ulcers of the tongue inclines me to think that though the acrid and very strong tobacco used by the poorest classes can and does produce ulceration of the tongue, the ordinary and milder tobaccos smoked by the majority in pipe and cigarette are probably far less frequently the cause of the sore tongue occasionally experienced, and attributed to it, than is some other associated but less obvious condition—namely some slight gastric disturbance. Let me illustrate this by quoting an experience which must be familiar to most smokers dwelling in towns.

The late Marcus Beck, professor of surgery in University College, London, often used to remark that he suffered from a sore tongue if he smoked much in London, whereas, using the same tobacco, he could smoke all day, unaffected in this way, when holidaying and out on the moors all day. Here is a case where the same quality of tobacco produces different effects according to the smoker's general condition, which when poor more often than not manifests itself by a more faulty digestion than otherwise. With the relief of mental and physical strain the gastric metabolism is better and no sore tongue occurs.

Is it not reasonable, therefore, to consider that the sore tongue of smokers is essentially, or etiologically, to be henceforth regarded as a peptic ulcer due to overlooked or unsuspected, because perhaps mild, gastric disturbance occurring in jaded town-dwellers? If so, perhaps in the sore tongue of smokers we may have a clue which may lead us to the discovery of the real cause of lingual cancer.

In conclusion, I suggest (1) that the trophic nerves governing gastro-intestinal metabolism, when exhausted by mental or emotional strain, give rise to the secretion of abnormal gastro-intestinal juices, which are unable to digest certain starchy foods, particularly potatoes, peas, and beans, and the absorption of the toxins arising from subsequent fermentation results in peptic ulcers of the tongue; (2) that the sore tongue of smokers (with the exception named previously) is due to associated mild gastric disturbance of the same kind; and (3) that these considerations as to the etiology of peptic ulcers may provide an important clue to the etiology of lingual cancer.

Even if my conclusions are shown to be unfounded, a discussion, focussing the experience of medical observers everywhere, cannot but be of the greatest assistance to future investigators.—I am, Sir, yours faithfully,

Harley-street, W., Jan. 12th, 1919. HENRY CURTIS, F.R.C.S.

CAUSES AND INCIDENCE OF DENTAL CARIES.

To the Editor of THE LANCET.

SIR,—Mr. R. Denison Pedley asks me to furnish some evidence of my statement "that there are among the inhabitants of this country more than 200 million carious teeth, as many alveolar abscesses (pyorrhœa alveolaris), and some 30 million root abscesses." Taking the population of the United Kingdom as 45 millions, this, according to my estimate, implies for each individual 4½ carious teeth, 4½ alveolar abscesses, and 2 root abscesses for every three persons. Does this estimate strike Mr. Pedley as excessive?

I have before me Dr. James Wheatley's 1914 report to the Education Committee of the Salop County Council, and an excellent report it is. Referring to his investigation into the prevalence of dental caries among elementary school children, he writes:—

"The figures have been in such close agreement each year that it appears certain that they may be taken as an accurate description of the amount of dental caries amongst the elementary school children of the county. The striking points are: (1) That only 3 per cent. of the children at age 12 and 5 per cent. at age 5 were free from caries; (2) that the average number of decayed teeth at the age of 5 was 6·8 and at the age of 12 was 4·8; (3) that out of 3794 children examined at the age of 5 no less than 1017 had ten or more decayed teeth, and out of 3580 children at 12,876, had seven or more decayed teeth."

When we come to examine adults we find that a considerable proportion of carious teeth have been extracted owing to the trouble they have caused, so that the number of carious teeth in a given mouth does not represent the number of permanent teeth which have become carious within it. Similarly, in regard to pyorrhœic alveoli, the number present does not take account of those which have closed up in consequence of extraction or spontaneous shedding of the teeth. The number of teeth spontaneously shed as the result of pyorrhœa is enormous, embracing as it probably does all those which are shed as the supposed result of senile decay. In other words, the edentulism of the aged is essentially pyorrhœic in origin.

In order to provide Mr. Pedley with figures I have hastily examined the teeth of 17 men, mostly discharged soldiers, occupying one of the wards of the West End Hospital for Diseases of the Nervous System. Their ages range from 21–43 years, and they come from various parts of England. I found the pyorrhœa average to be 9 (i.e., double my estimate), and the caries average to be 3 (i.e., one-third below my estimate).

Since pyorrhœa alveolaris is practically limited to adults, the average number of purulent alveoli in adults would need be considerably higher than 4½ (as it actually is in the series examined), in order to bring the average of the total population up to this figure. The caries average in my series would have been much higher but for the large number of extractions—i.e., 9 per individual. Had no carious teeth been removed the average would have been 12 (i.e., more than double my estimate).

I have no statistics to give regarding root abscesses. I shall be surprised, however, if the estimate of two such abscesses for every three persons is regarded as excessive by dental surgeons. I am, Sir, yours faithfully,

Cavendish-square, W., Jan. 11th, 1919. HARRY CAMPBELL.

CAUSES AND INCIDENCE OF DENTAL CARIES.

To the Editor of THE LANCET.

SIR,—I am glad your columns are being used to emphasise the connexion between soft, sugary, or starchy food and decay of the teeth. School clinics are doing much to cure and prevent caries at school age, but why should it be allowed to occur at all? Nature shows that the young animal should pass from its mother's milk to hard food, which keeps the teeth clean and exercises the jaws, and that with such diet animals rarely get caries. Museums show that caries is exceptional in uncivilised man. Yet our mothers are still, with medical approbation, encouraged to feed their babies as the teeth emerge on soft, sweet food, with its inevitable consequences of contracted jaws and decaying teeth.

Dr. Sim Wallace has shown that caries may be largely prevented without altogether imitating Nature if every meal is completed with a detergent food. If it is not practicable to revert to a diet which will produce a larger jaw and better developed teeth we may at least follow Dr. Wallace's teaching sufficiently to greatly diminish the occurrence of caries with all the suffering and ill-health which go along with it. The matter is largely in the hands of the medical practitioner.

I am, Sir, yours faithfully,

Woolwich, Jan. 8th, 1919. SIDNEY DAVIES.

AUTOTHERAPY OR BLEEDING.

To the Editor of THE LANCET.

SIR,—A new line of treatment is suggested in the annotation in THE LANCET of Dec. 28th, 1918, p. 889, on Dr. Luigi Meille's method of treating influenza by subcutaneous injection of the patient's serum, presumably containing antitoxins. Having tried this practice without beneficial results in another disease, I beg leave to record a negative observation. Two years ago, assuming that opsonins are free in serum, I withdrew 50 c.cm. of blood from a tuberculous patient showing severe intermittent pyrexia. Blood was run direct from the median basilic vein into a sterile flask and left to coagulate for 24 hours. Most of the serum was recovered and injected into the patient's groin. This was done twice with an interval of ten days. After withdrawing the blood there was a transient fall in temperature and in pulse-rate, but as the actual injection of serum had no influence on the disease, and as blood-letting is generally contra-indicated in pulmonary tuberculosis, the practice was abandoned.

May I also suggest that Dr. Meille's results were possibly due to the bleeding and not to the serum, and that the practice of bleeding, so universal in the past, may have some advantages over our indirect modern methods of reducing engorgement of arteries or veins. Until the middle of last century even healthy adults were regularly bled, and, according to Sir James Paget, "not one of these persons suffered harm." Again, Sir Thomas Watson considered venesection to be "a potent and life-preserving remedy" in many diseases. According to Quain, blood-letting in the early stages of pneumonia "relieves pain, abates fever, and, if it does not arrest the disease, it certainly appears to lessen its duration." Curiously enough, this author states that physicians first learnt that blood-letting was not a universal panacea during the influenza epidemic of 1830.

I am, Sir, yours faithfully,

London, Dec. 29th, 1918. HALLIDAY SUTHERLAND.

PURULENT BRONCHO-PNEUMONIA ASSOCIATED WITH THE MENINGOCOCCUS.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 11th "Bacteriologist" deals somewhat harshly with a short description I gave in THE LANCET of Dec. 28th, 1918, of "Six Cases of Purulent Broncho-pneumonia Associated with the Meningococcus." He states that this title is "wholly misleading," although I purposely used the words "associated with." Apparently he considers them synonymous with "caused by" or "due to." When, after summarising the facts, I gave what appeared to me the probabilities, I was most careful to commence by saying it was only my opinion. I make no pretence to "bacteriological proof," nor is this to be wondered at, seeing that three of the six patients were dead and the other three entirely convalescent at least a fortnight before I heard of them.

I published the notes because the series of cases, and their sequel in the occurrence of a case of cerebro-spinal fever, appeared to me so suggestive in the light of other reports not yet published, as to be quite worth recording. That the meningococcus does cause pneumonia in certain cases is believed by many,[1] but this little series of cases which I have been able so imperfectly to investigate becomes especially interesting if viewed in the light of information derived from such an outbreak as that at Colmar in January, 1906, which is fully described by Jacobitz.[2] The outbreak occurred in one company of a Jäger Battalion. Twelve patients (other than carriers) were proved to be infected by the meningococcus, and Jacobitz divides his 12 cases into five groups, thus:—

1. Two cases showing typical cerebro-spinal meningitis without complications.
2. Three cases showing meningococcus pneumonia in association with meningitis.
3. One case of pneumonia without meningitis. The symptoms included pyrexia ending by crisis, rusty sputum, and signs of consolidation. Microscopic examination of the sputum showed only Gram-negative intracellular cocci, which were cultivated and identified as meningococci by agglutination. Meningococci were also present in the naso-pharynx, but pneumococci were never observed in the sputum in this case.
4. Four cases of bronchial catarrh without meningitis. These patients were only moderately ill, but the sputum showed numerous meningococci, which were cultivated and proved by agglutination. All had meningococci also in the naso-pharynx.
5. Two cases of lung infection in which the meningococcus was found mixed with other bacteria.

Referring to my own series, may I add that none of the three convalescents have proved chronic carriers, although when first examined they all showed almost pure and very abundant cultures. This disposes of the explanation that coincidence had brought together three chronic carriers of Type I. One of "Bacteriologist's" criticisms is just, I should not have mentioned Pfeiffer's bacillus.

I am, Sir, yours Pfeiffer's bacillus.

J. A. GLOVER,
Captain, R.A.M.C.

Jan. 13th, 1919.

*** Dr. Glover will be interested to read a short paper by Dr. William Fletcher, published in this issue.—ED. L.

CROOKES'S LENSES.

To the Editor of THE LANCET.

SIR,—May I ask any of your readers to be so kind as to explain what are the special benefits which accrue to the use of Crookes's tinted lenses? Does their light-yellow tint merely cut off from the eye a small portion of the red and violet rays which go to make up white light? and, if so, would not any glasses of the same tint have the same effect? Or have they by their composition other properties than these, and, if so, what are they, and what is the construction of the glass which gives them these properties?

I am, Sir, yours faithfully,

Jan. 11th, 1919. ENQUIRER.

*** In consequence of the prevalence of cataract amongst glass bottle makers researches were undertaken by Sir William Crookes some years ago into the possibility of obtaining glass opaque to the noxious ultra-violet and ultra-red rays and still transparent to light. In the course of his experiments a large number of metals were used, salts of which were incorporated in the experimental glasses, over 300 varieties being prepared. While none of them fulfilled the above conditions with perfection, some of them did very nearly, and the "No. 1" Crookes glass which is now supplied by opticians, while being practically completely transparent to light, does effectually cut off a very high percentage of both heat and actinic rays, and in this respect is superior to ordinary amber or smoked glass for cases in which it is desirable to protect the eyes from these rays without interfering with vision. Opticians also supply a "No. 2" Crookes glass which is partially opaque to light, suitable to be employed only in those cases where the amount of visible light is excessive. Sir William Crookes's own report on his experiments will be found in the Philosophical Transactions of the Royal Society for 1913.—ED. L.

[1] Cf. Sophian, Epidemic C.S.M., p. 55.
[2] Zeitschrift für Hygiene, Bd. lvi., 1907.

THE LATE HENRY SANDFORD.

To the Editor of THE LANCET.

SIR,—I have read with great regret your announcement of Mr. Henry Sandford's death. He was, I believe, the last survivor of those connected with THE LANCET, in any capacity, when I joined the staff 47 years ago. Mr. Potter, his senior partner, was then in the full vigour of bodily and mental health, but whenever he was unable to attend at THE LANCET Office "young Sandford," as he was then called, used to take his place.

By a melancholy coincidence Dr. Thomas Buzzard died a few days later than Mr. Sandford. With him passed away the last of the literary and editorial staff existing when I joined. At that time there were, in addition to Dr. James Wakley, Tilbury Fox (who acted as editor during Dr. James Wakley's illness), J. P. Steele, Brudenell Carter, James Grey Glover, Christopher Heath, Anstie, Henry Power, Jeffrey Marston, Harry Leach, Stallard, John Netten Radcliffe, Vivian Poore, and others whom at the moment I cannot recall. Thomas Henry Wakley, F.R.C.S., eldest son of the Founder of the paper, was at that time in charge of the business side of the journal. All these and a few others were, I remember, at the Jubilee Dinner of THE LANCET in 1873.

It is with pleasure I notice the continued vitality and prosperity of THE LANCET.

Wishing you a happy and prosperous new year,

I am, Sir, yours faithfully,

Harley-street, W., Jan. 6th, 1919. JOHN TWEEDY.

Obituary.

WILLIAM ASHTON ELLIS, M.R.C.S. ENG.

Mr. W. A. Ellis, who died on Jan. 2nd, aged 66 years, was son of the late Robert Ellis, M.R.C.S., of London. Educated at Westminster (1865–1870), where he won a Queen's scholarship in 1867, he entered St. George's Hospital in 1871, took the M.R.C.S. in 1876, and the L.R.C.P. in 1878. He is chiefly to be remembered as a Wagnerian scholar; for some years he edited *The Meister* (quarterly journal of the Wagnerian Society), and he was the author of "Richard Wagner's Prose Works," in eight volumes, and of a life of Wagner in six volumes. Soon after qualification he had acted as resident medical officer to the Western Dispensary, and during the war he had resumed his old post there. Mr. Ellis was formerly honorary secretary of the Association of Members of the Royal College of Surgeons of England, and during the latter years of the last century he was a prolific writer on the subject of reform of that body.

LAWRENCE HENRY BENNETT, M.A., M.B. OXON., M.R.C.S. ENG.

Mr. L. H. Bennett, who died suddenly on Dec. 28th at Paignton, was third son of Henry Bennett, of Bedminster, Glos. Educated at Clifton (1877–80), he matriculated at Trinity College, Oxford, in 1880, at the age of 18. He took his B.A. degree in 1884, and entered at St. George's Hospital the same year, obtaining the qualification of the Conjoint Board in 1889 and taking the M.A., M.B., B.Ch. Oxon. in 1890. After serving as ophthalmic assistant and orthopædic assistant at St. George's Hospital he settled in practice at East Ilsley, near Newbury, Berks, and later moved to Paignton, where he had an extensive practice.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

SUBSCRIPTIONS TO THE SECOND APPEAL.

THE following subscriptions have been received up to Monday, Jan. 13th:—

	£	s.	d.
Mr. E. Spencer Evans (monthly)	0	10	0
American Red Cross Commission for Belgium (monthly) ...	200	0	0
Mr. J. F. Cownie	1	1	0
Dr. C. Buttar	3	3	0
Dr. Vincent S. Hodson	1	1	0
Dr. E. S. Green	1	1	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W. 1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE SERVICES.

ROYAL ARMY MEDICAL CORPS.

Major (acting Lieut.-Col.) H. A. Davidson to be acting Colonel whilst employed as an Assistant Director of Medical Services of a Division.

Major C. W. O'Brien relinquishes the acting rank of Lieutenant-Colonel on re-posting.

Major (acting Lieut.-Col.) H. F. Shea to be acting Colonel whilst specially employed.

Temp. Major C. H. G. Ramsbottom to be acting Lieutenant-Colonel whilst specially employed.

Capt. (acting Major) J. W. Bennett to be acting Lieutenant-Colonel whilst specially employed.

Temp. Capt. (acting Major) W. Kennedy-Taylor to be acting Lieutenant-Colonel whilst in charge of Guildford War Hospital.

Major C. P. Thomson is placed on the half-pay list.

To be acting Majors: Capts. R. A. Austin, D. W. Beamish, C. McQueen; Temp. Capts. R. Bruce Low, A. S. Wakely, A. G. M. Middleton, O. R. L. Wilson, J. R. Anderson, J. G. Moseley, H. J. de Brent, T. R. Amyot, J. McDonnell, A. R. Esler, W. L. Casselis.

Temporary Captains to be acting Majors whilst specially employed: S. E. Martin, J. C. Muir, F. R. Barwell.

Temp. Capts. J. Anderson, L. F. Hemmans, F. G. Bell relinquish the acting rank of Major on re-posting.

Temp. Lieuts. T. A. Matthews and N. J. Newbould to be temporary Captains.

D. C. Parmenter to be temporary Honorary Lieutenant whilst serving with No. 22 General Hospital (Harvard Unit).

Canadian Army Medical Corps.

Temp. Capt. (acting Major) M. H. Allen to retain the acting rank of Major while employed in D.G.M.S. Office.

Hon. Capt. (acting Hon. Major) A. E. Clifton, D.C.M., to retain the acting rank of Honorary Major while employed as Inspector of Technical Equipment in D.G.M.S. Office.

Temp. Hon. Capt. J. W. White relinquishes the acting honorary rank of Major on ceasing to command a Depôt.

SPECIAL RESERVE OF OFFICERS.

Capt. P. Walsh relinquishes the acting rank of Major on re-posting.

Captains to be acting Majors: S. K. Young, W. O. Tobias. Whilst specially employed: A. J. Brown, W. C. Mackie.

W. Oats to be Lieutenant.

TERRITORIAL FORCE.

Major (acting Lieut.-Col.) J. B. Yeoman relinquishes acting rank on ceasing to be specially employed.

Major W. R. E. Williams relinquishes his commission on account of ill-health.

Captains to be acting Majors while specially employed: R. E. Pitts, J. W. Wood, W. L. Cockroft, A. C. Tibbits.

Capt. (acting Major) G. S. Williamson relinquishes his acting rank on ceasing to be specially employed.

Capt. L. E. H. R. Barker relinquishes his commission on account of ill-health contracted on active service.

Major A. M. H. Gray, Capts. A. E. Webb-Johnson, W. J. Wilson (Bt. Major), G. A. Williamson, Lieut. F. J. Cleminson (temp. Capt.) (retains his temporary rank) are transferred from the List of Officers Supernumerary for service with the Officers Training Corps.

Officers seconded for service with the R.A.F.: Major J. W. Keay, Capts. J. E. Dunbar, V. T. Ellwood, A. D. Kennedy, J. E. Lascelles.

1st Southern General Hospital.—Major W. Kirkpatrick to be acting Lieutenant-Colonel whilst specially employed, and to be seconded.

5th Northern General Hospital.—Capt. J. W. Patrick is restored to the establishment.

2nd London Sanitary Company.—Capt. (acting Major) F. S. Carson relinquishes his acting rank on ceasing to be specially employed.

1st Northern General Hospital.—Major (acting Lieut.-Col.) G. Hall, C.M.G., relinquishes his acting rank on ceasing to be specially employed.

1st Eastern General Hospital.—Capt. (acting Major) R. V. Slattery relinquishes his acting rank on ceasing to be specially employed, and remains seconded.

3rd Southern General Hospital.—Capt. W. B. Secretan is seconded for duty with the Reading War Hospital.

4th London General Hospital.—Lieut.-Col. Sir N. I. C. Tirard is retired on attaining the age limit, and retains the rank of Lieutenant-Colonel.

Major (Brevet Lieut.-Col.) Smart, from 1st Scottish General Hospital, to be Lieutenant-Colonel on the permanent personnel.

TERRITORIAL FORCE RESERVE.

Capt. E. S. Stork, D.S.O., from Attached to Units other than Medical Units, to be Captain.

Capt. P. C. Mitchell relinquishes his commission on ceasing to be employed, and retains the rank of Captain.

Lieuts. G. T. Nichols and C. W. Stewart relinquish their commissions on ceasing to be employed, and retain the rank of Lieutenant.

ROYAL AIR FORCE.

C. G. Galpin (temp. Capt., ret. pay) is granted a temporary honorary commission as Major.

Capt. G. Fehrsen relinquishes his commission on ceasing to be employed, and retains his rank.

DEATHS IN THE SERVICES.

Surgeon-General Sir James Howard Thornton, on Jan. 6th, aged 85. He entered the I.M.S., in which his father was a major, in 1856, and the two served throughout the Indian Mutiny. The son then went to China, and was later wounded in action in the Khasia and Jynkia Hills campaign. He was chief medical officer in the Suakin and Hargara expeditions. He was five times mentioned in despatches, received four medals with seven clasps, the Khedive's Star, the C.B., and was finally created K.C.B. in 1904. He retired in 1891 to settle at Hove, where he became a magistrate and a valued member of the town council.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.

Monday, Jan. 20th.

GENERAL MEETING OF FELLOWS: at 5 P.M.

Lecture:

Lieut.-Colonel Sir James Barrett, R.A.M.C.: The Management of Venereal Diseases in Egypt during the War (with illustrations).

Tuesday, Jan. 21st.

GENERAL MEETING OF FELLOWS: at 5 P.M.

Ballot for Election to the Fellowship. (Names already circulated.)

Thursday, Jan. 23rd.

GENERAL MEETING OF FELLOWS, at 5 P.M.

Discussion:

On "Shock," opened by Professor Bayliss, F.R.S., and Dr. Dale, F.R.S.

MEETINGS OF SECTIONS.

Wednesday, Jan. 22nd.

SURGERY (Hon. Secretaries—V. Warren Low, Cyril A. R. Nitch): at 5.30 P.M.

Paper:

Major C. W. Waldron, C.A.M.C., and Captain E. F. Risdon, C.A.M.C.: Mandibular Bone Grafts.

To be followed by a Discussion on "Bone Grafting." Speakers:—Captain W. E. Gallie, C.A.M.C., Major Naughton Dunn, R.A.M.C., Major Alwyn Smith, D.S.O., R.A.M.C., Major Robert Milne, R.A.M.C.

Cases will be shown at 5 P.M.

Friday, Jan. 24th.

STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—G. E. C. Pritchard, H. C. Cameron, C. P. Lapage): at 5 P.M.

Cases:

Dr. F. J. Poynton: (1) Myoclonia Multiplex in a Girl aged 2½ years; (2) Pseudo-hypertrophic Muscular Paralysis.

Discussion:

The Etiology, Prevention, and Non-operative Treatment of "Adenoids," opened by Dr. Harry Campbell and Dr. Edmund Cautley.

Those wishing to take part in the Discussion are requested to forward their names to the Senior Hon. Secretary.

The Royal Society of Medicine keeps open house for R.A.M.C. men and M.O.'s of the Dominions and Allies. The principal hospitals in the metropolis admit medical officers to their operations, lectures, &c. Particulars on application to the Secretary at 1, Wimpole-street, London, W. 1.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Six Hunterian Lectures on Phases in the Life and Work of John Hunter. The Lectures will be illustrated by Hunterian Preparations, Drawings, and Records:—

MONDAY, Jan. 20th.—5 P.M., Lecture I.:—Prof. A. Keith: The Cradle of the Hunterian School.

WEDNESDAY.—5 P.M., Lecture II:—Prof. A. Keith: The Rise and Decline of the Hunterian School in London.

FRIDAY.—5 P.M., Lecture III.:—Prof. A. Keith: The Time, Place, and Circumstance of John Hunter's Career in London.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

Clinics each week-day at 2 P.M., Wednesday, Friday and Saturday also at 10 A.M.

(Details of Post-Graduate Course were given in issue of Nov. 30th, 1918.)

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY, Jan. 22nd.—4 P.M., Prof. I. W. Hall: Industrial Hygiene in Relation to War Strain and Technical Development.

Medical News.

UNIVERSITY OF LIVERPOOL.—The following have passed the January examination for the Diploma in Public Health: Shaikh Ghulam Mohamed, M.B., Ch.B., and Peter Paul Wright, M.B., B.Ch., B.A.O.

A SCHEME for establishing a chair of Mental Diseases at Edinburgh University has been approved by the University Court. The board of the Royal Edinburgh Asylum for the Insane has made the foundation possible by offering an endowment of £10,000.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly meeting of the Council was held on Jan. 9th, Sir George Makins, the President, being in the chair.—It was resolved to accord a vote of congratulation to Sir John Lynn Thomas on being made a Knight of the British Empire.—In accordance with the recommendation of the Museum Committee, it was resolved that the skeleton of the Greenland whale be taken down and placed in a room in the basement.—The best thanks of the Council were given to Mr. Alban Doran for presenting to the library five volumes of his literary contributions, together with five other volumes of pamphlets and articles mainly on anatomical and gynæcological subjects.—The secretary reported that one dissertation on "Injuries and Diseases of the Pancreas and their Treatment," the Jacksonian prize-subject for 1918, had been received.—It was resolved that in pursuance of the action taken by the Council in 1915 the President be requested to represent to His Majesty's Government that in any legislation relating to the promotion of the public health provision should be made for ensuring an adequate supply of material for the anatomical and surgical instruction of students and practitioners of medicine.

URBAN VITAL STATISTICS.

(Week ended Jan. 11th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality was 16·0, against 14·8 and 16·1 per 1000 in the two preceding weeks. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 15·8, or 0·8 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 7·9 in Walthamstow, 8·2 in Hornsey, and 8·3 in Ilford, to 22·7 in West Hartlepool, 23·7 in Hastings, and 27·3 in Liverpool. The principal epidemic diseases caused 164 deaths, which corresponded to an annual rate of 0·5 per 1000, and included 64 from diphtheria, 46 from infantile diarrhœa, 17 each from measles and whooping-cough, 15 from scarlet fever, and 5 from enteric fever. The deaths from influenza, which had steadily declined from 7559 to 441 in the nine preceding weeks, further fell to 380, and included 68 in London, 56 in Liverpool, 19 in Birmingham, 16 in Manchester, and 14 each in Bristol and Leeds. There were 5 cases of small-pox, 1058 of scarlet fever, and 1139 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital; against 3, 1062, and 1116 respectively at the end of the previous week. The causes of 52 deaths in the 96 towns were uncertified, of which 10 were registered in Liverpool, 8 in Birmingham, 5 in London, and 3 each in Manchester, Gateshead, and Tynemouth.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had increased from 14·8 to 16·7 per 1000 in the three preceding weeks, further rose to 18·6 per 1000. The 399 deaths in Glasgow corresponded to an annual rate of 18·6 per 1000, and included 9 from whooping-cough, 5 from infantile diarrhœa, 3 from diphtheria, 2 from scarlet fever, and 1 from enteric fever. The 122 deaths in Edinburgh were equal to a rate of 18·9 per 1000, and included 11 from whooping-cough and 2 from diphtheria.

Irish Towns.—The 165 deaths in Dublin corresponded to an annual rate of 21·2, or 2·2 per 1000 below that recorded in the previous week, and included 2 from infantile diarrhœa. The 157 deaths in Belfast were equal to a rate of 20·4 per 1000, and included 2 from infantile diarrhœa and 1 from measles.

Communications, Letters, &c., to the Editor have been received from—

A.—Col. J. G. Adami, A.D.M.S.

B.—Dr. H. Brown, Lond.; Messrs. John Bell, Hills, and Lucas, Lond.; Dr. F. J. C. Blackmore, Lond.

C.—Dr. H. Campbell, Lond.; Col. S. L. Cummins, A.M.S.; Capt. J. Campbell, R.A.M.C.(S.R.); Mr. H. G. H. Clarkson, Birstwith; Dr. C. Coombs, Clifton; Dr. A. Cox, Lond.; Dr. S. Cheiliah, Colombo; Chicago School of Sanitary Instruction; Dr. J. A. Calantar, Lond.; Dr. C. M. Craig, Abergele; Dr. E. L. Collis, Lond.; Dr. R. Craig, Lond.; Dr. D. E. Core, Lond.; Mr. H. Curtis, Lond.; Mr. J. Cabburn, Lond.

D.—Dr. W. F. Dearden, Manchester; Dr. S. Davies, Lond.; Mrs. Duffy, Jesmond; Dr. J. N. Dyson, Eastbourne.

E.—The Misses Erwin, Lond.

F.—Capt. J. Fryer, R.A.M.C.; Mr. H. Faulds, Hanley; Capt. W. Fletcher, R.A.M.C.; Major E. B. Fothergill, R.A.M.C.; Surg. G. Findlay, R.N.; Lt.-Col. H. French, R.A.M.C.; Factories, Chief Inspector of, Lond.; Capt. J. N. Fergusson, R.A.M.C.; Dr. A. W. Falconer, Aberdeen.

G.—Capt. J. A. Glover, R.A.M.C.; Dr. H. I. Goldstein, Camden, New Jersey; Lt.-Col. J. H. P. Graham, R.A.M.C.(S.R.)

H.—Dr. C. W. Hutt, Brighton; Mr. E. H. Hunt, Secunderabad (Deccan); Lt.-Col. A. F. Hurst, R.A.M.C.; Lieut. J. A. B. Hicks, R.A.M.C.

I.—Illuminating Engineering Society, Lond.

K.—Prof. A. M. Kennedy, Glasgow.

L.—London Units of the Scottish Women's Hospitals; Major J. R. Lee, R.A.M.C.; Local Government Board, Lond.; Mr. M. Little, Lond.

M.—Dr. R. Morton, Lond.; Dr. I. Moore, Lond.; Ministry of Munitions of War, Lond.; Capt. H. C. Martin, R.A.M.C.; Mr. A. P. Melville, Edinburgh; Mr. P. McBride, Edinburgh.

N.—*Nursing Times*, Lond., Editor of; National League for Health, Maternity, and Child Welfare, Lond.; National Food Reform Association, Lond.

O.—Oliver-Pell Electric and Manufacturing Co., Lond.; Official Press Bureau, Lond., Director of; Mr. J. Offord, Lond.

P.—Dr. J. Pearse, Lond.; Major J. Parkinson, R.A.M.C.; Dr. H. R. Prentice, Lond.

R.—Mr. B. S. Rowntree, York; Royal College of Surgeons of England, President and Council of; Royal Institution of Great Britain, Lond.; Mr. P. B. Roth, Lond.; Dr. J. D. Rolleston, Lond.; Royal Sanitary Institute, Lond.; Capt. H. Robinson, R.A.M.C.; Mr. R. P. Ratnakar, Manchester; Capt. J. Ryle, R.A.M.C.(S.R.)

S.—Sir George Savage, Lond.; St. George's Hospital Medical School, Lond., Dean of; Mr. J. Singh Nalia; Dr. P. L. Sutherland, Wakefield; Mr. A. B. Searle, Sheffield; Mrs. H. R. Spurrell, Lond.; Selborne Society, Lond.; Gen. Sec. of; Mr. J. E. Sykes, Huddersfield; Dr. R. V. Solly, Exeter; Capt. J. L. Stoddard, M.C., U.S.A.

T.—Dr. J. Tatham, Oxted; Lt.-Col. E. N. Thornton, S.A.M.C.; Sir John Tweedy, Lond.

U.—University of Liverpool.

W.—Dr. S. A. K. Wilson, Lond.; West London Hospital Post-Graduate College; Western Chemical Co., Hutchinson, Minn.; Dr. F. J. Waldo, Lond.

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2

Appointments.

ALLEN, V. F., L.R.C.P. & S. Edin., L.F.P.S Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Swaffham District of Norfolk.

CLEGG, S. J., M.D. Manch., Deputy Medical Officer of Health for Newcastle.

HACKETT, J. A. W., M.B., Ch.B. Edin., reappointed Medical Officer for the Gainsborough Urban District.

HALL, ROBERT, L.R.C.P. Ed., L.R.C.S. & L.M. Ed., Examiner in Clinical Medicine in Belfast University, and Consulting Physician to the Ulster Volunteer Force Hospital for Discharged Sailors and Soldiers, Belfast (under Ministry of Pensions).

HARDCASTLE, W., M.B. Lond., and STEPHENSON, G. E., Captain, R.A.M.C., Police Surgeons for Newcastle.

ROSS, D. M., M.B., Ch.B. Edin., Physician Superintendent, James Murray's Royal Asylum, Perth.

SHARPLEY, J. E., M.R.C.S., L.R.C.P. Lond., reappointed District Medical Officer of the Blyborough District, Gainsborough Union.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead Borough Hospital.—Jun. H.S. £170.

Birmingham General Dispensary.—Tuber. Officer. £600.

Birmingham General Hospital.—Vacancies on Res. Staff.

Bradford Royal Eye and Ear Hospital.—Ophth. S.

Chichester, Royal West Sussex Hospital.—H.S. £160.

Croydon County Borough (Ante-Natal Clinic).—Female Med. Prac. £1 1s. per session.

Dorchester, Dorset County Asylum.—Second Asst. M.O. £300.

Dorset County Council.—Temp. Asst. M.O.H. £400.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—Asst. Res. M.O. £125. Also Casualty Officer. £120.

Eccles and Patricroft Hospital, near Manchester.—Res. H.S. £250.

Edinburgh, Venereal Diseases Scheme.—Female Asst. M.O. £400.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Female Temp. Asst. S.

Exeter City Mental Hospital, Digbys, near Exeter.—Asst. M.O. £300.

Hellingly, East Sussex County Asylum.—Temp. Asst. M.O. 7 gs. per wk.

Hull City Education Committee.—Asst. Female School M.O. £400.

Manchester, Ancoats Hospital, Mill-street.—Hon. P.

Monmouthshire County Council.—Female Asst. M.O. £400.

North Riding Asylum.—Locum Tenens M.O. 7 gs. per week.

Northampton County Borough.—Temp. Tuberc. Officer. £400.

Putney Hospital, Lower Common, S.W.—Res. M.O. £150.

Rochester, St Bartholomew's Hospital.—Clin. Asst. £150.

Royal Free Hospital, Gray's Inn-road, W.C.—H.P. £50. Casualty H.S. £100.

Swindon Borough.—Asst. M.O.H. £500.

Taunton, Taunton and Somerset Hospital.—Sen. H.S. £250.

University of London.—Examiners.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. £200.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Vacancies on Medical Staff.

Westmorland Sanatorium, Meathop, Grange-over-Sands.—Sen. Asst. M.O. and Asst. Tuberc. Officer. £350.

Whitehaven and West Cumberland Infirmary.—Res. H.S. £150 to £180.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Alford, Aberdeen; Heckington, Lincoln; and Ilminster, Somerset.

Births, Marriages, and Deaths.

BIRTHS.

ALTOUNYAN.—On Jan. 6th, at Hampstead, the wife of Captain E. H. R. Altounyan, R.A.M.C., of a daughter.

CORFIELD.—On Jan. 12th, at Pembroke-road, Clifton, Bristol, the wife of Captain Charles Corfield, R.A.M.C. (T.F.), of a daughter.

FAIRBAIRN.—On Jan. 8th, at Blackpool, the wife of Major J. Fairbairn, M.B., R.A.M.C., of a daughter.

WILLIAMS.—On Jan. 9th, at Greystones, Canford Cliffs, Bournemouth, the wife of Dr. C. Campbell Williams, of a son.

MARRIAGES.

BLISS—COOPER.—On Jan. 8th, at the Parish Church, Henley-on-Thames, Captain (M. F. Bliss, M.C., R.A.M.C., to Violette Mary, only daughter of the late John Manning-Cooper, Melrose-avenue, Cricklewood.

MACKESSACK - RIBTON GORE.—On Jan. 9th, at the Church of St. James the Less, Plymouth, Captain R. J. Mackessack, R.A.M.C., to Ada Mary Frances, eldest daughter of Colonel and Mrs. Ribton Gore, Thornfields, Lisnagry, Co. Limerick.

STOUTE—PIKE.—On Jan. 9th, at Sutton, Surrey, Douglas Garnet Stoute, Major, R.A.M.C., of Georgetown, Demerara, to Margerie Anne (Nancy) Pike, of Sutton.

DEATHS.

BERNARD.—On Jan. 7th, at New Silksworth, Sunderland, Gerald Bernard, M.D.

BUTCHER.—On Jan. 10th, at Holyrood, Cleveland-road, Ealing, William Deane Butcher, M.R.C.S., aged 71.

THORNTON.—On Jan. 6th, on the eve of his 85th birthday, Surgeon-General Sir James H. Thornton.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HEALTH, MEDICINE, AND SANITATION IN INDIA.

I.

THERE has recently been presented to Parliament a statement exhibiting the moral and material progress and condition of India during the year 1916–17. The following are amongst the references to health, medical, and sanitary matters contained in it:—

Medical Administration in War-time.

The year was marked by an unprecedented and almost unlimited growth in military medical administration. There is not space to record in detail the list of new hospitals, instituted or taken over by Government, the great expansion of many existing hospitals, the large number of fresh medical units established for service overseas or in India itself, the immense additions made to personnel and equipment, and the special preventive measures organised against infectious and epidemic diseases, flies, heat, glare, and other discomforts incidental to campaigning in the East. We can mention here only two matters of particular interest.

The first is a new departure in the foundation of orthopædic institutes for the treatment of wounded and disabled soldiers. A large and very fully equipped institute of this kind is being established at Debra Dun, and the King Edward Hospital at Cawnpore has also been taken over for conversion into a special orthopædic hospital for Indian soldiers. Another such institute has been founded in Bombay.

The second matter is the increasingly difficult problem of providing trained medical officers. The civil side of the Indian Medical Service is not only the Government channel of medical administration and instruction for the whole of India, but it forms also the reserve of medical officers for the Indian Army on mobilisation. All Indian Medical Service officers liable to surrender from civil employ were returned to the Army in the very early stages of the war, and many others not technically liable were returned with or soon after them. Only the barest minimum of officers was retained to occupy the most important of the administrative and executive charges and to maintain at full working pressure the medical schools and colleges on which practically the whole supply of medical practitioners, official and non-official, in this country depends. Even so, the numerical strength of the service proved far below military demands, and has had to be supplemented by the grant of temporary commissions to numbers of civil assistant surgeons and private practitioners. Still greater difficulties beset the provision of subordinate medical officers for the Army. Exceptionally favourable terms have been offered to induce civil sub-assistant surgeons to enter military employ, but the number of candidates is still far short of requirements. On the other hand, there is a point beyond which the medical needs of the vast population of India cannot be sacrificed, and we have every reason to believe that the response already made to military demands has reduced the available medical personnel in most provinces to that point. Government has in this matter a responsibility to the civil population of India which it must discharge, and were a widespread increase of plague or other epidemic to find it unprepared and inadequately equipped the consequences would be disastrous.

Public Health and Medicine in Madras.

In the days before the war it was a common charge against the organisation of medical relief in India that the staff was quite insufficient to supply the needs of both the military and civil branches in the contingency of a great war. That there was some measure of reason for this apprehension can be seen from the fact that the Madras Presidency has had to surrender to the military department all its Indian Medical Service officers, except 16, in addition to 27 assistant surgeons and 76 sub-assistant surgeons. During the past year, in spite of shortage of staff, and notwithstanding financial difficulties, it was possible to increase both the number of institutions and the number of patients relieved, while at the same time there was a pronounced fall in the hospital death-rate. This state of affairs could not have been maintained had it not been for the efficiency of the remaining officers of the superior service, who have each been doing several men's duties, and of the assistant surgeons who have been called on to take charge of important hospitals.

During the year 1916–17 more than seven million patients were treated in the public hospitals and dispensaries maintained or aided by the State and by local bodies. There was a very large and satisfactory increase in the number of medical students, due partly to the opening of a new medical school at Calicut. The Pasteur Institute treated a record number of patients, and efforts are being made to collect reliable statistics as to the efficacy of the treatment.

In Madras City a careful malaria survey has been made and preventive measures have been taken on a fairly large scale against this disease. By means of itinerating dispensaries something is also being attempted in the Mufassal, but the huge area over which malaria prevails precludes any possibility of concentrations of effort such as have been successful in the cities of Europe and America. Great differences of opinion exist as to the efficacy of the measures taken in the Madras Presidency for the prevention of the spread of plague, but the fact remains that the larger part of the Presidency has enjoyed a comparative immunity from the disease, which may or may not be ascribed to the working of the plague passport and notification systems. As regards cholera there has for some time been a tendency for epidemics to be less serious and more local. It is hoped that the improvement of water-supply and the spread of education in hygiene will, in a very few years, reduce the mortality from cholera to much smaller dimensions.

Bombay.

The year was far from being as healthy as its predecessor, and the number of in-door and out-door patients treated in hospitals and dispensaries showed a further increase. Among in-door patients this occurred chiefly among cholera, small-pox, and malaria cases, while malaria was the chief disease amongst out-door patients. Eight sub-assistant surgeons were placed on special duty in the most malarious parts.

The second half of the year was marked by a rise in plague mortality, which reached its maximum in December. The Deccan districts, the Southern Mahratta country and Bombay City were most seriously affected, but deaths were reported from all except three districts. Special inoculators were sent to the badly-infected districts, and inoculations were performed on a larger scale than in 1915–16. As usual, these resulted in a much lower incidence of attacks of, and mortality from, the disease amongst inoculated persons, and confidence in inoculation is steadily increasing. Work and investigations in connexion with rat destruction were continued, and hydrocyanic acid gas was tried as a suitable poison for rats and fleas in houses and grain stores.

From cholera the heavy mortality of almost 20,000 deaths was recorded. East Khandesh and other districts, to which the disease spread from it, were the chief sufferers. In sanitary matters arrangements have been made for the examination of drinking-water, the supplies of various important towns have been improved, and a committee investigated the problem of the sanitation of pilgrim centres, which are a fruitful source of epidemic diseases. Small-pox cases were more numerous than in the previous year, but less than the decennial average. Vaccination is voluntary except in the large towns, and is being popularised by the use of glycerinated calf vaccine. District sanitary associations have been formed and have done useful work, while a sanitary demonstration held at Belgaum was largely attended.

A new civil hospital was opened and another completed during the year. Six taluka dispensaries were also opened and many additions and improvements made at civil hospitals. To spread a knowledge of the danger of tuberculosis instruction to school teachers and children was given and lectures and demonstrations were held. Owing to the war the medical services have been depleted to the utmost extent, and the loss of staff and curtailment of expenditure make present progress difficult. No fewer than 43 officers in the medical service out of the sanctioned staff of 58, the entire staff of military assistant surgeons employed on civil duties, almost one-third of the civil assistant surgeons, a large number of civil sub-assistant surgeons, and many of the nurses and the trained servants of civil hospitals were surrendered to meet military requirements. In spite of this depletion a large military hospital in Bombay was worked by a civil medical staff, and various civil hospitals have undertaken the treatment of military cases.

(To be concluded.)

THE BISMUTH ORDER.

THE Minister of Munitions has modified the Bismuth Order made by him and dated March 12th, 1918. On and after the 10th day of January, 1919, Clause 2 is to be omitted and a fresh Clause 2 (*b*) substituted. This sets out that no return is required from any person whose total stock in hand is not intended to be used in connexion with the manufacture of metallic alloys and who has not, during the period for which a return was necessary, exceeded a supply of 56 lb. of bismuth metal or any alloy thereof.

LEMON JUICE OR LIME JUICE?

To the Editor of THE LANCET.

SIR,—Mrs. Alice Henderson Smith, in her most interesting paper (THE LANCET, Nov. 30th, 1918), for which we must all be grateful, says that "about 17 years later" than the return of Sir John Ross, therefore about 1860, the Admiralty began to use true lime juice, which is not antiscorbutic.

Could she certainly say if it was lime or lemon juice used in the Crimean War and in the Baltic (1854)? I write far from books of reference, but I remember that in the Baltic a French ship suffered severely from scurvy, met an English frigate (? *Meander*), and got from her "lime juice," which speedily cured the scurvy. This was, I now suppose, probably lemon juice; could Mrs. A. H. Smith perhaps tell us?

For the papers of Miss H. Chick and others on vitamines we must all be greatly obliged to them.

I am, Sir, yours faithfully,

W. E. HOME,
Fleet Surgeon.

Dec. 13th, 1918.

NEW RECORDS CONCERNING IMHOTEP (ASCLEPIOS).

SOME 13 years ago considerable interest in connexion with the history of ancient medicine was aroused in the career of Imhotep, the celebrated physician of a very early age in Egypt, whom the Greeks subsequently associated to Asclepios. This sage's story was elaborated with considerable skill from the fragmentary evidence of papyri and inscriptions by Professor Sethe and others, and ably utilised by Dr. Richard Caton for the Harveian Oration of 1904.[1] Some years later an important Greek papyrus concerning Asclepios-Imhotep was published by the Egypt Exploration Fund, and summarised in our pages.[2] Since then, excepting a few references in Egyptological journals, the matter has not received any further elucidation.

In last year's "Bulletin de l'École Française d'Archéologie Orientale" of Cairo, M. Henri Gauthier has edited "Un Nouveau Monument du Dieu Imhotep." This is an inscribed base, or plinth, for a statue of a personage named Pedubastit (which also gives the name of his wife and three daughters). He was a prophet, or priestly scribe, of Imhotep, who is therefore in the record recognised as a deity and he is styled son of Ptah in the texts. Pedubastit's religious duties, among other matters, consisted in seeing that the various ancient fêtes or holy days of Imhotep were properly observed, and in the panegyric of his career he sets forth these days fully in a list giving six dates, but not in their correct chronological order. In another text upon the same stone, however, Pedubastit, or his survivors for him, more completely describe the events in Imhotep's life which caused each day selected to have been reserved for a festival in his honour.

This information is new and of great interest. The first occasion for commemoration was Imhotep's birthday, 16th of the month Epiphi. His mother is stated to have been a lady named Khardit Ankh. The second fête was the anniversary of Imhotep's presentation to his divine father Ptah and to Sekmet, a goddess, paredra of Ptah. The third day was kept in honour of "the time when Sekmet destroyed the vile Asiatics in a naval battle upon the red lake." The fourth day, 17th of month Mesore, was, according to M. Gauthier's reading of the new-found records, that of Imhotep's death, and the 23rd of the same month that of his burial.

Other Egyptologists who have read the inscription dispute this rendering, thinking the fourth fête was that of the onset of the physician's fatal illness and the fifth that of his decease. Only a few remarks are possible here. Firstly, as contrary to M. Gauthier. During his career as a physician Imhotep must have become famed for his medical skill, and consequently revered. But it was probably not until long after his earthly career had ended that he was canonised and finally alleged to have been of semi-divine origin and so a deity. This was a common assertion as to procreation of the deified Pharaoh. It is obvious that the fête day of Sekmet's victory was foisted into the catalogue of the medical hero's memorials. However, Imhotep at some remote date was deified. Now an interval of but six days between death and burial was insufficient to perform the funerary rites and proper mummification of even the poorest personages, but it is just possible that Imhotep died in a year when the Egyptians inserted an additional month to rectify their calendar—if so it would give 35 days. On the other hand, verily a festival in honour of the illness of a god of healing would have been curiously contradictory. Moreover, there is great weight in an argument used by M. Gauthier—i.e., that never does an Egyptian text refer to the illness of a deity, neither does the writer ever recollect even a reference to individual illness except in medical papyri or in some book of a Job-like type in which the author laments senile decay. The thousands of obituary notices merely state a person was born in a certain year, died in a subsequent one, and sometimes enumerate the length of his life. However, the monument tells us that on the fourth day of the month Paoni Imhotep's spirit departed for Paradise. It adds that he was interred in the great Dehan which is believed to have been a vast cave, or excavation, in the desert near Memphis. In later time its surrounding land had become an immense Campo Santo. It probably bore some title indicative of being sacred to Imhotep, which word the Greeks rendered as "Asclepeion."

Also we have many inscriptions omitting all reference to his godship, while Imhotep's titles, too, are human enough, so also are his parents and wife. It is evident that, in time, there were two traditions of him. One, the oldest, makes him a marvellous physician, and great in other sciences and friend of royalty. The second speaks of him as a deity. The new papyrus of Imhotep Asclepios referred to throws no light upon the subject. It is a literary effusion of a Greek author who, after Imhotep had been identified with Asclepios in order to exalt him, alleged that Menkaura, the builder of the Great Pyramid, had granted certain bounties to Asclepios, son of Hephaestus, and to two other people named Horus and Caleobis, who, he says, were sons of Hermes and Apollo. Horus was not, however, son of Hermes-Thot, but Apollo himself, whilst Caleobis is unknown. Imhotep was not an uncommon name in Egypt and Horus was still more frequent. There may have been sepulchral texts near the pyramid of people with these names, or the statement may be pure invention. The other new-found record discussed here is of value as confirming the fact by an inscription of one of his temple hierophants that Imhotep was deified and had numerous worshippers.

[1] THE LANCET, 1904, i., 1769. [2] THE LANCET, 1915, ii., 1204.

THE USE OF CREOSOTE IN INFLUENZA.

To the Editor of THE LANCET.

SIR,—The use of creosote during the recent epidemic appears to have been fairly general, but what has impressed one more particularly has been the manner in which it has been possible to abort pneumonia. I had been sceptical of this until several cases occurred, and I am personally convinced that this has been due to the creosote and potassium iodide. I doubt if this has received sufficient attention, the early exhibition of this drug is of such capital importance; in some cases one has found that the patient has been unable to accept creosote in mixture, then resort has been made to capsules or some preparation of guaiacol in cachet.

I am, Sir, yours faithfully,

Jan. 11th, 1919. I.M.S.